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ng on the Lagoon"

David P. Anderson, M.D.

vol 60 #1

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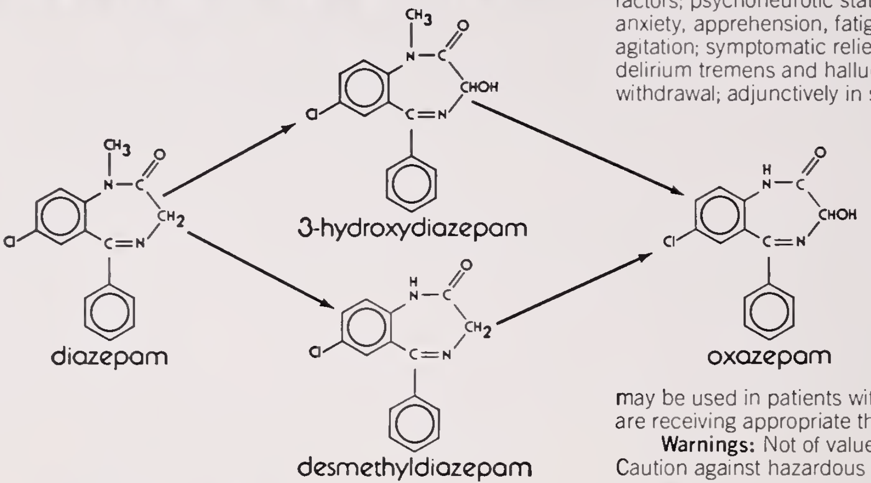
A pharmacokinetic character all its own



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Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

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Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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President's Letter

Continuing Medical Education

The most misunderstood and controversial issue currently is continuing medical education. It is a truism that CME has been a very large part of our professional lives in one form or another since Hippocrates. It is a truism that the AAFP has had CME requirements for recertification for thirty years, and recently many other specialty societies have followed suit. It is a truism that fourteen state medical associations and sixteen state BME are authorized to require CME for re-registration.

For some time the MSMA has believed that continuing professional education has merit for its members and that such education should be stressed by the Association as contributing to better patient care. Prior to 1973 the MSMA Committee on Medical Education presented to the House of Delegates a resolution stating its considered favor of a program of required medical education as a partial requirement for continuing MSMA membership. Specific recommendations, based on the Oregon program were presented and passed by the House of Delegates in 1973. The first triennium began January 1, 1974.

In 1976 Minnesota Statutes were amended by the State Legislature to read: (214.12) (continuing education). The health related and non-health related licensing boards may promulgate by rule requirements for renewal of licenses designed to promote the continuing professional competence of licenses. These requirements of continuing professional education or training shall be designed solely to improve professional skills and shall not exceed an average attendance requirement of fifty clock hours per year. All requirements promulgated by the State Boards of Medical Examiners shall be effective commencing January 1, 1977.

Here, then, is the scene in December 1976—the *voluntary* state medical plan nearing completion of its first triennium and a *mandatory* state medical board plan preparing for its first flight into CME.

Much controversy among our members has occurred because of the MSMA posture. Some physicians argue that a true professional should not need mandated CME, as it has been shown statistically that ninety percent of physicians participate voluntarily out of their own volition. Many of our educators threaten to leave organized medicine as compliance would be beneath their professional dignity. *It is a fact* that there is no proof thru controlled studies that CME alters or improves a physician's practice habits or improves his professional competence. To further debate the issue the monitoring process could become our society's highest budget item and certainly will increase health care costs for both consumer and physician as the requirements will consume by simple arithmetic some fifteen million man hours per year (300,000 physicians × 50 hours). Duplicate efforts by the AMA, AAFP, Minnesota State Orthopedic Society, MSMA and now the State Board of

Medical Examiners is wasteful and inappropriate and finally our failure as leaders and administrators in the MSMA to effectively communicate and record the process, the requirements and the philosophy of CME has almost negated our first triennium. To date there are some 800 physicians who have failed to comply—primarily through lack of understanding and/or improper communication.

With understanding, the process of recording and complying with CME can be relatively simple; however, the organized learning activities must be relevant to the needs of the individual practice, it must be accessible and the courses should display excellence—in other words, they should be an effective learning activity so when the physician has completed a program it is possible to document that in fact the activities have helped physicians to improve their competence, activities, and attitudes—evaluated by changes in performance so as to improve patient care.

Although compliance in the existing five category requirements which range from formal programs in an academic institution to non-supervised individual activities should be relatively simple, our experience in the first triennium has not been so.

I feel that we should abandon our requirements for the first triennium, form a refreshing partnership with the State Board of Medical Examiners, not as a signal of failure, but rather as an opportunity to expend additional time, money and effort to accelerate our lagging accreditation of institutions, to advertise more fully the unique and existing medical educational resources of three medical schools and several medical centers, to monitor accrediting of present programs more adequately and to encourage new methods of simplified documentation.

Maybe with this renewed effort we can accomplish the ultimate aim of CME—to correct outdated knowledge, to introduce new knowledge, and to master new specific skills and techniques which should improve the performance of physicians.

Richard E. Anonsen, M.D.
President
Minnesota State Medical Association

Continuing Education

Minnesota Radiological Society

Winter Meeting—Minnesota Radiological Society, February 5, 1977. Sheraton-Ritz Hotel, Minneapolis, MN. 3rd Annual K. W. Stenstrom Memorial Lecture, David E. Kuhl, M.D., Director-Nuclear Medicine, University of California at Los Angeles. "The Present and Future of Transmission and Emission C.T. Scanning."

Minnesota Urological Society

Pyelogram Conference—Friday, January 14, 1977, 6:30 p.m. L'Hotel Sofitel. Contact: S. J. Antolak, Jr., M.D., 228 Lowry Medical Arts Bldg., St. Paul.

Editor's Notebook

Financial Squeeze on Hospitals: Implications for Practicing Physicians

> *"The organization of medicine is not a thing apart which can be subjected to study in isolation. It is an aspect of culture whose arrangements are inseparable from the general organization of society."*
>
> **Walton H. Hamilton, "Medical Care for the American People," 1932**

The mail this week brought copies of two new journals across my desk. These journals are *Health Care Management Review,* a quarterly edited by Alan Sheldon, M.D., a psychiatrist turned manager who helped start Harvard's Health System Management Program; and *Journal of Health Politics, Policy and Law,* published quarterly by the Department of Health Administration of Duke University. I now subscribe to these two new journals because each describes events and forces outside of Medicine that are shaping what goes on inside.

The Duke publication sets forth its purpose this way:

> "The purpose of the *Journal of Health Politics, Policy and Law* is to focus on the initiation, formulation and implementation of health policy. The title reflects a conscious effort to be inclusive and the editorial policy will be aimed at contributors and readers reflecting a wide variety of scholars, practitioners, solid journalists and policy makers—those who study, analyze and influence the issues at the cutting edge of the changing policies and priorities relating to the health and mental delivery system."

Some of the things being said in these two journals have implications for practicing physicians.

Financial Problems of Hospitals

Consider financial problems of hospitals.

In the current issue of *Health Care Management Review,* Professor J. B. Silvers of the Indiana School of Business, says American hospitals are in sad financial shape.[1] Indeed, he cites evidence and sources indicating the hospital industry—from the Social Security System to institutions—is approaching bankruptcy.[2,3] Signs and symptoms of impending insolvency are there—escalating costs, exorbitant capital outlays, inadequate contributions, rate and expenditure crises, delayed payments to suppliers, short term loans to pay employees, and huge new debts at high interest rates.

Why Has the Financial Squeeze Occurred?

Why has this financial squeeze happened? And what does it portend for practicing physicians?

Let's take the why first, and let's start in 1966 with the passage of Medicare and Medicaid.

These government acts spurred demands for hospital services—and for capital. From 1960 to 1965 capital investment in hospitals was $7 billion. But from 1970 to 1975, capital investment rose to an estimated $14 to $20 billion. In other words, two to three times as much capital was required to finance increasing specialization, rapid obsolescence, new technology, and inflation.

Second, as the flow of government contributions swelled, the proportion of private philanthropic contributions fell and debts grew (Table 1). As early as 1968, debt was the biggest source of capital financing. It became necessary for hospitals to tap private investors at all levels of the investment market, to compete with non-health related institutions for capital, and to meet the financial disciplines imposed by those investors. Capital, in short, was no longer cheap.

TABLE

	Philanthropy	Government	Debt	Internal	Total
1962	44.7%	12.7%	11.9%	30.7%	100.0%
1966	33.5%	13.0%	22.3%	31.2%	100.0%
1968	24.3%	17.2%	40.8%	17.7%	100.0%
1973	20%	20%	45%	15%	100.0%

Sources of contributions to capital in voluntary hospitals. Note that as government contributions have grown, hospitals' traditional sources of capital—philanthropy and internal earnings—have dwindled, and reliance on debt financing has shot up. Table adapted by permission from table in book by J. B. Silvers and C. K. Prahalad, Financial Management of Health Institutions, Spectrum Publications, 1974. Original information from Hospitals, J.A.H.A. and from private estimates.

Third, other forces were at work. In 1973, the government imposed strict wage-price controls. These controls forced hospitals to consume their cash reserves and did not permit hospitals to qualify for price relief. To make matters worse, cost-based reimbursement formulas made it hard for hospitals to reinvest funds from retained earnings, i.e. excess of revenues over costs.

If hospitals are in such a precarious financial position, what does this mean to the practicing physician?

Administrator's Options

To answer, I believe you have to understand what options hospital administrators have to improve their institutions' financial position. Professor Silvers has outlined seven basic things administrators can tinker with to change their hospital financial outlook: (1) price and reimbursement formulas; (2) patient volume and mix; (3) material and nonlabor purchases; (4) hiring; (5) wage and salary levels; (6) capital investments; and (7) financing.[1] To these seven, I would add one other you will be hearing more about—cost-containment programs.

Implications for Physicians

I think the financial problems of hospitals and the administrator's options mean you are going to be subjected to two powerful, sometimes contradictory, forces. These will be: 1) hospital cost-containment programs and 2) hospital marketing. The most powerful of these two will be hospital marketing, for hospitals will compete directly with physicians for private patients. But I'm ahead of myself. Let's look at cost-containment programs first.

Hospital Cost-Containment Programs

In an editorial in *Journal of Health Politics, Policy and Law,*[4] Thomas Rose, a graduate of the Hospital Administration Program at the University of Minnesota and President of Blue Cross and Blue Shield of North Carolina since 1973, gives physicians and hospital these courses of action for containing hospital costs:

1. Physicians can seek alternatives to hospitals for inpatient care;
2. Hospitals can set up pre-admission testing for X-ray and laboratory work as outpatients the day before surgery;
3. Hospitals can install outpatient surgery units;
4. Physicians can transfer patients to skilled nursing units as quickly as medically possible;
5. Hospitals can group ambulatory patients in self-care units;
6. Physicians and institutions can set up HMO's, as a way of reducing the number of inpatient days;
7. Hospitals and physicians can make more vigorous use of utilization reviews;

8. Hospitals can avoid duplicating facilities, i.e. can engage in comprehensive planning with other institutions;
9. Hospitals can educate the public, i.e., launch public education campaigns explaining why things cost so much.

You have heard most of these before, except perhaps for the last, which is really a form of public marketing and leads to my last section.

Hospital Marketing

How can administrators ease a hospital's financial squeeze?

There are many options, as previously noted, but the most important is to increase patient volume and mix (i.e. the type of patient being seen). Increasing patient volume and changing the type of patient referred is *not* under direct management control: it involves external factors—factors outside the institution. It also involves marketing the hospital to patients, to physicians, to the community, and to donors.[5]

To help hospitals survive the financial squeeze, administrators must control and shape these external markets. For this reason, you will increasingly see hospital marketing departments as part of their corporate structure. These departments may be called other things, e.g. "division of community affairs," or "outreach programs," but their goal will be to attract patients.

In any event, the key figure in any hospital marketing program will be physicians.

As Philip Kotler, Professor of Marketing at Northwestern University, and author of "Marketing for Non-Profit Organizations," points out:

> "The doctors not only deliver medical care but also attract the hospital clientele. Hospitals do not do direct marketing to attract patients, that is, they do not place ads saying they have first-rate facilities for maternity or any other services. They rely entirely on their affiliated physicians to refer patients to the hospital. The doctors are marketing intermediaries."

So be prepared to be the target (and the competitor) of hospitals and their marketing activities.

These are some of the things hospitals are doing and will be doing to funnel more patients into their beds:

1. In a broad sense, hospitals will portray the image of community health centers.
2. This image will broaden their base of support, and give them the opportunity to set up health fairs, preventive health clinics, and special clinics to serve patients in their immediate communities.
3. Hospitals will establish special programs to serve those patients who are "in need" of their services, e.g. the elderly patients with special diseases, e.g. malignancy or neurological disorders.
4. Hospitals will establish "outreach clinics," staffed by paid hospital physicians, for drugs, alcoholism, smokers, special diseases, and dieting disorders, to bring more patients under their sphere of influence.
5. Hospitals will organize HMOs so they can capture large organizational audiences, assuring themselves of a stable patient base.
6. Hospitals will become more consumer-oriented, trying to achieve more humane internal design, more warmth on the part of nurses, a better quality of food, and more private rooms with the amenities.
7. Hospitals will launch capital fund drives with prominent businessmen and physicians as prime targets.
8. Hospitals will establish multiple publications with targeted mailing lists, to community leaders, to employees, to potential donors, to physicians, and to patients, in order to inform those in the outside world of their services and to solicit their support.

9. Hospitals will increasingly hire more MDs to staff the institution at all hours, to cover the emergency rooms, to keep the various clinics running, and to run "outreach clinics" at sites removed from the hospital.
10. Hospital will employ professional fund raisers, directors of development, and directors of community affairs, to contact affluent donors, to raise funds from government granting agencies and philanthropic organizations, and to keep the community informed.

These are a few of the activities hospitals will engage in. They will be essentially marketing activities and will be the hospitals' purposeful gathering together of outside people, outside assets, and outside facilities to survive.

I do not approve of all of these marketing activities, but I think they are best understood in context of the financial problems of American hospitals.

Richard L Reece MD

References

1. Silvers JB: Indentity crisis: financial management in health, health care management review. 1:31-46. 1976.
2. Spivak J: Social security system is on its way to going broke. Wall Street J February 27, 1965.
3. Boissonean R: No. 1 is financial management. Hospital financial management, pages 14-16, February, 1976.
4. Rose T: Meeting the challenge of rising hospital costs. J of Health Politics, Policy and Law 1:146-150, 1976.
5. Marketing for Nonprofit Organization. Prentice-Hall, Inc. 436 pages, 1975.

Minnesota Society of Clinical Pathologists
Symposium of the Lung
Saturday, April 23, 1976
Health Sciences Building, University of Minnesota

9:45-10:00 a.m.	Welcome Address and Announcements, Donald Larson, M.D.
10:00-10:45 a.m.	Functional Anatomy and Histology of the Lung, W. Robert Anderson, M.D.
10:45-11:30 a.m.	Pulmonary Diseases of Uncertain Etiology, Donald F. Gleason, M.D.
11:30-12:00 a.m.	Interpretation of the RAST Test, Henry A. Homburger, M.D.
12:00- 1:30 p.m.	Luncheon at Campus Club, Coffman Union
1:30- 2:00 p.m.	Laboratory Diagnosis of Viral Pneumonia, Henry Balfour, Jr., M.D.
2:00- 2:45 p.m.	Carcinoma of the Lung, Robert S. Fontana, M.D.
2:45- 3:00 p.m.	Coffee
3:00- 3:30 p.m.	Pulmonary Cytology, Lewis B. Woolner, M.D.
3:30- 4:30 p.m.	Pathology of Pulmonary and Mediastinal Tumors, Tumors of the Lung, Stephen L. Ewing, M.D. Tumors of the Mediastinum, Juan Rosai, M.D.

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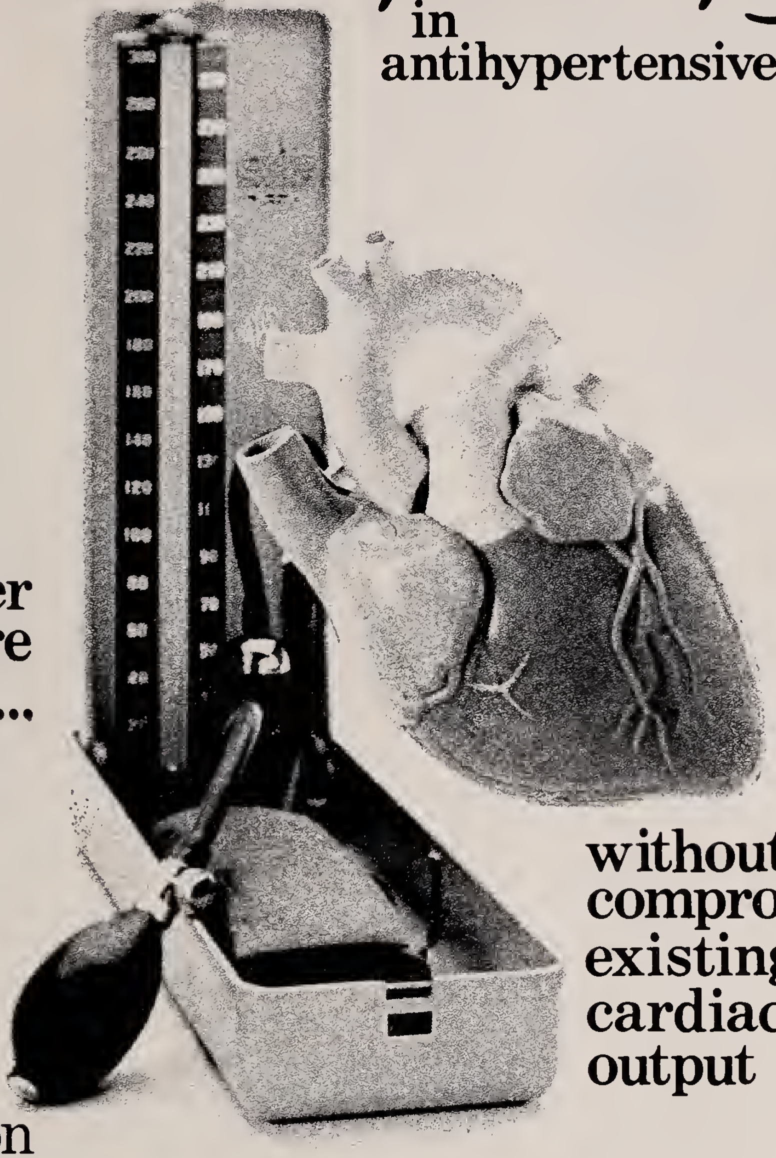

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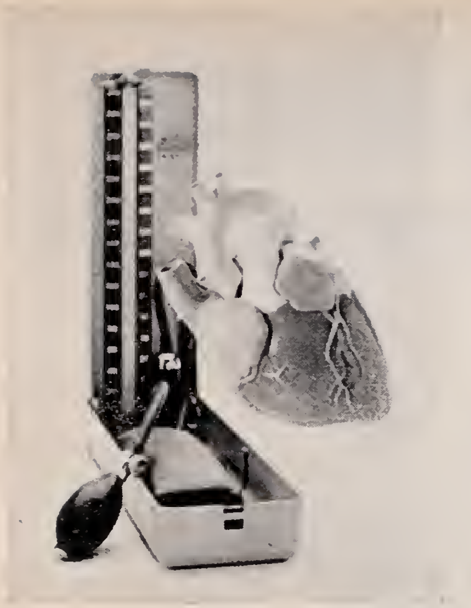

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Warnings: It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. Read this section carefully to understand these reactions.

With prolonged methyldopa therapy, 10% to 20% of patients develop a positive direct Coombs test, usually between 6 and 12 months of therapy. Lowest incidence is at daily dosage of 1 g or less. This on rare occasions may be associated with hemolytic anemia, which could lead to potentially fatal complications. One cannot predict which patients with a positive direct Coombs test may develop hemolytic anemia. Prior existence or development of a positive direct Coombs test is not in itself a contraindication to use of methyldopa. If a positive Coombs test develops during methyldopa therapy, determine whether hemolytic anemia exists and whether the positive Coombs test may be a problem. For example, in addition to a positive direct Coombs test there is less often a positive indirect Coombs test which may interfere with cross matching of blood.

At the start of methyldopa therapy, it is desirable to do a blood count (hematocrit, hemoglobin, or red cell count) for a baseline or to establish whether there is anemia. Periodic blood counts should be done during therapy to detect hemolytic anemia. It may be useful to do a direct Coombs test before therapy and at 6 and 12 months after the start of therapy. If Coombs-positive hemolytic anemia occurs, the cause may be methyldopa and the drug should be discontinued. Usually the anemia remits promptly. If not, corticosteroids may be given and other causes of anemia should be considered. If the hemolytic anemia is related to methyldopa, the drug should not be reinstituted. When methyldopa causes Coombs positivity alone or with hemolytic anemia, the red cell is usually coated with gamma globulin of the IgG (gamma G) class only. The positive Coombs test may not revert to normal until weeks to months after methyldopa is stopped.

Should the need for transfusion arise in a patient receiving methyldopa, both a direct and an indirect Coombs test should be performed on his blood. In the absence of hemolytic anemia, usually only the direct Coombs test will be positive. A positive direct Coombs test alone will not interfere with typing or cross matching. If the indirect Coombs test is also positive, problems may arise in the major cross match and the assistance of a hematologist or transfusion expert will be needed.

Fever has occurred within first 3 weeks of therapy, sometimes with eosinophilia or abnormalities in liver function tests, such as serum alkaline phosphatase, serum transaminases (SGOT, SGPT), bilirubin, cephalin cholesterol flocculation, prothrombin time, and bromsulphalein retention. Jaundice, with or without fever, may occur, with onset usually in the first 2 to 3 months of therapy. In some patients the findings are consistent with those of cholestasis. Rarely fatal hepatic necrosis has been reported. These hepatic changes may represent hypersensitivity reactions; periodic determination of hepatic function should be done particularly during the first 6 to 12 weeks of therapy or whenever an unexplained fever occurs. If fever and abnormalities in liver function tests or jaundice appear, stop therapy with methyldopa. If caused by methyldopa, the temperature and abnormalities in liver function characteristically have reverted to normal when the drug was discontinued. Methyldopa should not be reinstituted in such patients.

Rarely, a reversible reduction of the white blood cell count with primary effect on granulocytes has been seen. Reversible thrombocytopenia has occurred rarely. When used with other antihypertensive drugs, potentiation of antihypertensive effect may occur. Patients should be followed carefully to detect side reactions or unusual manifestations of drug idiosyncrasy.

Use in Pregnancy: Use of any drug in women who are or may become pregnant requires that anticipated benefits be weighed against possible risks; possibility of fetal injury can not be excluded.

Precautions: Should be used with caution in patients with history of previous liver disease or dysfunction (see Warnings). May interfere with measurement of: uric acid by the phosphotungstate method, creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, falsely high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. It is important to recognize this phenomenon before a patient with a possible pheochromocytoma is subjected to surgery. Methyldopa is not recommended for patients with pheochromocytoma. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites.

Stop drug if involuntary choreoathetotic movemer
occur in patients with severe bilateral cerebrovasc
lar disease. Patients may require reduced doses
anesthetics; hypotension occurring during an
thesia usually can be controlled with vasopresso
Hypertension has recurred after dialysis in patier
on methyldopa because the drug is removed by t
procedure.

Adverse Reactions: *Central nervous syste*
Sedation, headache, asthenia or weakness, usua
early and transient; dizziness, lightheadedne
symptoms of cerebrovascular insufficien
paresthesias, parkinsonism, Bell's palsy, decreas
mental acuity, involuntary choreoathetotic mo
ments; psychic disturbances, including nightma
and reversible mild psychoses or depression.

Cardiovascular: Bradycardia, aggravation of angi
pectoris. Orthostatic hypotension (decrease da
dosage). Edema (and weight gain) usually reliev
by use of a diuretic. (Discontinue methyldopa
edema progresses or signs of heart failure appe

Gastrointestinal: Nausea, vomiting, distention, c
stipation, flatus, diarrhea, mild dryness of mouth, s
or "black" tongue, pancreatitis, sialadenitis.

Hepatic: Abnormal liver function tests, jaundi
liver disorders.

Hematologic: Positive Coombs test, hemoly
anemia. Leukopenia, granulocytopenia, thro
bocytopenia.

Allergic: Drug-related fever, myocarditis.

Other: Nasal stuffiness, rise in BUN, breast enlar
ment, gynecomastia, lactation, impotence, decreas
libido, dermatologic reactions including eczema a
lichenoid eruptions, mild arthralgia, myalgia.

Note: Initial adult dosage should be limited
500 mg daily when given with antihypertensi
other than thiazides. Tolerance may occur, usua
between second and third month of therapy;
creased dosage or adding a thiazide frequen
restores effective control. Patients with impai
renal function may respond to smaller doses. S
cope in older patients may be related to increas
sensitivity and advanced arteriosclerotic vascu
disease; this may be avoided by lower doses.

How Supplied: Tablets, containing 125
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packages of 100 and bottles of 100 and 10
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Facial Injuries in Hockey Players

KENT WILSON, M.D., M.S.;* BARCLAY CRAM, M.D.;* EUGENE RONTAL, M.D.;#
and MICHAEL RONTAL, M.D.#

This study documents the rate of facial injury in hockey players from young amateur to professional. Recent regulations which require facial protection for nearly all amateur hockey players are reviewed and measures to decrease the frequncy of facial injury are discussed.

"*. . . A hockey player assumes a considerable risk every time he takes to the ice.*"[1]

North American ice hockey from its inception has been known as a rough sport with considerable inherent risk of injury as a result of player contact with other players, equipment, or the rink structure. The problem of hockey related injuries and their prevention is a topic of great interest currently because of the explosive increase in the sport's popularity. Amateur hockey participation has shown a 25 fold increase in the last 20 years, and the number of professional teams has more than tripled in the last 10 years.[2] The State of Minnesota is recognized nationally as an area of great hockey interest, because the high school program is the largest in the United States and the amateur program is exceeded in team registrations by only two other states.[3] A conservative estimate of the number of players who participated in organized amateur hockey in the State of Minnesota during the 1974-75 season is 37,000. A more accurate figure may range to 60,000 players for that year.

There is an increasing public awareness of the risk of injury associated with ice hockey. This awareness arises not only from increasing participation, but also from the highly publicized aggressive and intimidating style of professional hockey play which has resulted in serious injury and criminal legal action.

The study of hockey injury-risk has been difficult and those surveys which have been carried out have frequently been marred by inadequate sampling techniques or have consisted of a series of injuries with only tenuous relations to a specific population.[4-6] Other studies have been relatively inaccessible.

The study reported here was undertaken in an effort to more clearly define the risk of facial injury in North American Ice Hockey. The spectrum of hockey players from youngest amateur to professional was sampled. It was hoped that the results of such a study would assist safety committees and governing boards in their effort to reduce facial injuries in hockey players. This objective has been realized since this study in conjunction with that of Horns served as the scientific basis for the resolution passed by the MSMA House of Delegates suggesting that all amateur hockey players in the State of Minnesota be required to wear full facial protection.[4] On the basis of that recommendation and other encouragement, the Minnesota State High School League in mid-September, 1976, passed regulations advocating facial protection for all high school hockey players during the 1976-77 season and requiring full facial protection for the 1977-78 season and beyond.[7] This study with other studies served as the basis for the Amateur Hockey Association of the United States rule change in June of 1976, which requires full face protection for nearly all amateur hockey players in the United States.[8]

---

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Methods and Materials

The objective of this study was to determine the rates of injury for various types of facial trauma, to determine the mechanism of these injuries, and to determine the players' attitudes regarding the prevention of facial injury. The mechanism was a questionnaire which the players completed during calendar 1975. The questionnaire was designed to elicit identifying data including age, hockey position played, and seasons of experience. The respondents were asked to indicate the total number of facial injuries they had sustained as well as to enumerate specific types of injuries, such as fracture, laceration, etc., and respond to questions about facial protective equipment acceptability.

Four groups of players were studied so that the spectrum of hockey facial injury might be determined. The four groups are progressively older with increasing experience, proficiency, and number of seasons of exposure. The total number of respondents was 853 players (Table 1A). The youngest population consisted of 299 members of the Lake Region Hockey Association of St. Paul, Minnesota. These players ranged in age from seven to 17 years and had participated in from one to eight seasons of organized hockey play. This group was 24 percent of the 1975-76 membership in the Lake Region Hockey Association (LRHA) and is virtually 100 percent of the regional subgroup of that league which was sampled. This regional subgroup accurately reflects the composition of the entire league in regard to age and experience. The second group studied is the 200 varsity players in the St. Paul High School system (SPHS). These 200 players are 100 percent of that 1975-76 population. They ranged in age from 10 to 19 years and had participated in one to 12 seasons of organized hockey play. The third group of hockey players consisted of 180 members of the Western Collegiate Hockey Association (WCHA). These 180 players represent 72 percent of the population which participated in the 1974-75 season. They ranged in age from 17 to 26 years and had participated in one to 18 seasons of organized hockey play. The fourth population studied consisted of 174 players of the National Hockey League (NHL). These 174 players are 57 percent of the NHL participants during the 1974-75 season. These players ranged in age from 18-41 years and had played from three to 35 seasons of organized hockey.

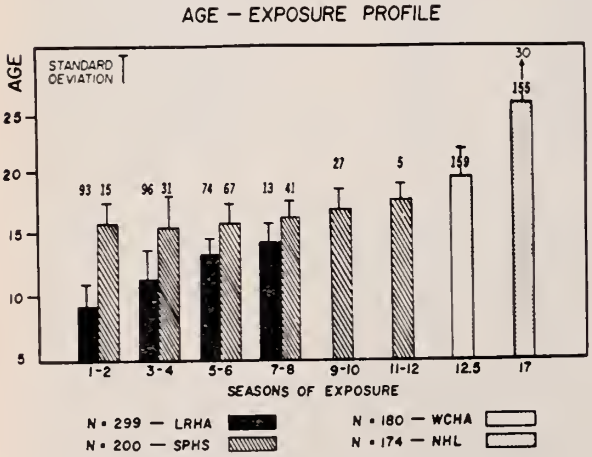


Table 1A—Exposure Profile. The mean age and the number of seasons of exposure as well as the number of players in each of the nongoalie populations is presented.

The rates determined in this study are defined as the number of positive responses to a question divided by the total number of responses in each group. These rates indicate the number of injuries per man. If the rate is multiplied by 100 it yields a percentage injury rate. Because of the cumulative nature of the data and methods of determination, the rates reflect the number of injuries within a population of fixed age and experience and do not indicate the rate or risk in relation to a specific unit of time. These questionnaire based rates are most probably low estimates of the true injury rate. This suspicion is suggested by experience gained in football injury rate determination. Questionnaire based rates were found to be one-half to two-thirds of the more accurate injury rates determined by review of medical records in closed populations and player interviews.[9]

Results

Rate of Nonspecific Injury Occurrence

Table 1B indicates the rate of nonspecific facial injury. Any injury severe enough to be remembered is included in this rate. The trend of increasing facial injuries with increasing age and experience is evident. Approximately seven percent of the youngest players stated that they had sustained some type of facial trauma. Fifty-four to 66 percent of the players had sustained a memorable facial injury in the LRHA and SPHS groups who played seven to eight seasons. Goalies in this group had a negligible rate of injury. Ninety-five percent of nongoalie players in the WCHA and 93 percent of nongoalie NHL players reported having sustained a facial injury. Seventy-six percent of WCHA goalies and 74 percent of NHL goalies reported having sustained a facial injury.

Facial Fractures

The facial fracture rate in the four groups studied is seen in Table 2. The LRHA had the lowest rate. Only the nongoalie group reported any facial fractures. The SPHS group, which is somewhat older and has somewhat more experience, showed a somewhat higher rate of fracture. The WCHA nongoalie group showed a facial bone fracture rate of .62 per man while the goalie population had a fracture rate of only .33 per man. The NHL nongoalie player reported a facial bone fracture rate of 1.15 per man while the professional goalies reported a fracture rate of 1.32 per man. The distribution of facial fractures in the nongoalie populations are presented in Tables 3A and 3B. It is apparent that the nose is the most frequently fractured facial bone.

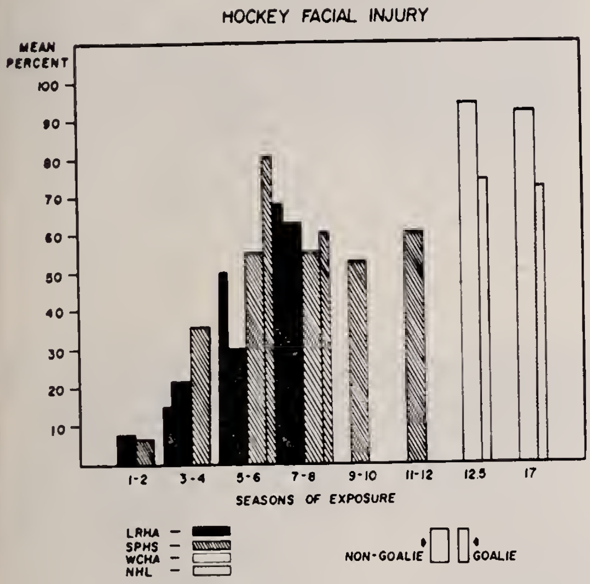


Table 1B—Hockey Facial Injury. This table presents the responses for both the goalie and nongoalie population to the question "Have you sustained a facial injury while playing hockey?"

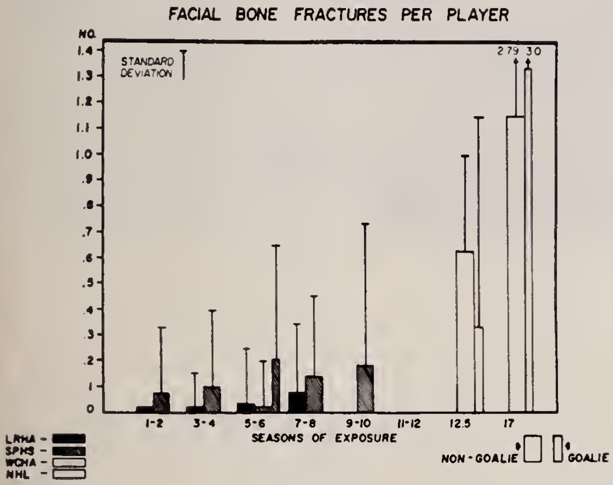
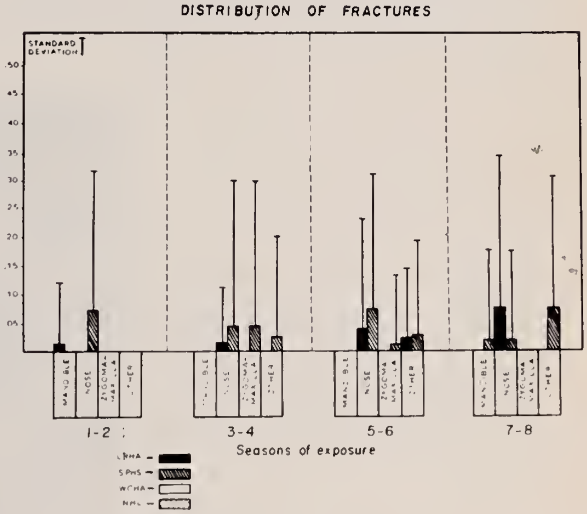
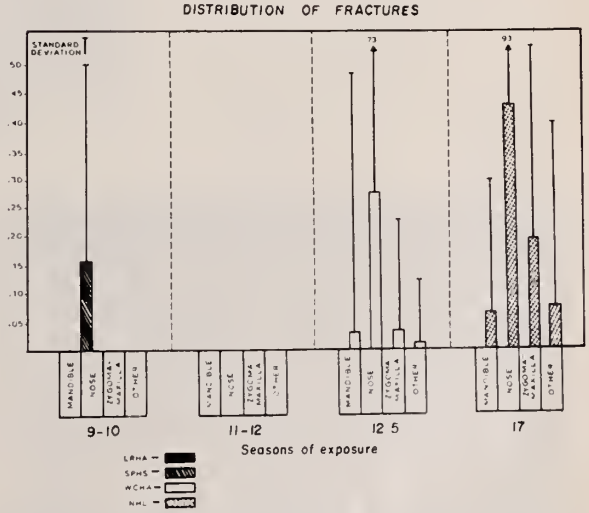


Table 2—Facial Bone Fractures. This table indicates that there is a low, but consistent rate of fracture in young, amateur hockey players and that a dramatic increase in the rate of fracture is seen in the college and professional populations. It is interesting to note that the professional goalie population reported a greater rate of fracture than did the nongoalie players, though this difference is not statistically significant.





Tables 3A and 3B—Distribution of Fractures. It is apparent that the nose is the most frequently fractured of the facial bones in all populations studied.

Fig. 1—The vast majority of hockey injuries are the result of accidental contact. (Wide World Photos—by permission.)

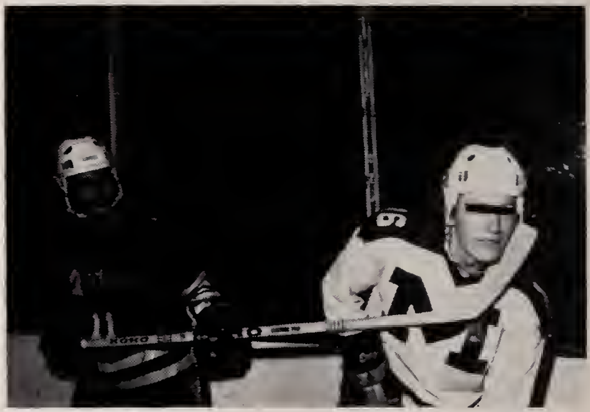


Fig. 3—The stick is the most common cause of facial injury in the non-goalie population. High-sticking, as demonstrated here must be discouraged.

Fig. 2—Only at the college and professional level does fighting become a significant cause of facial injury. (Wide World Photos—by permission.)

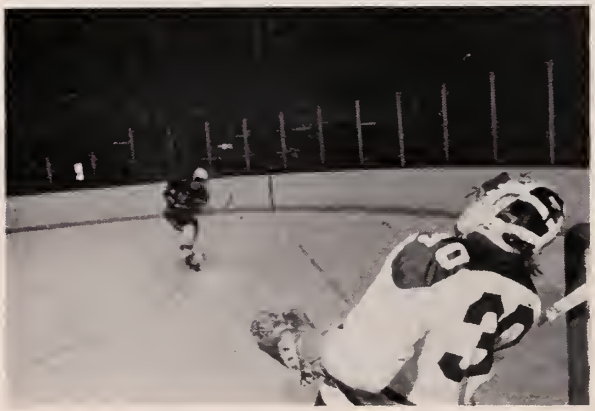


Fig. 4—The puck (arrow) is the most common cause of facial injury in the goalie population. There is a trend away from the mask shown here which requires the facial skeleton for support. Many goalies, especially world class, find that masks which do not allow facial impact of the puck (wire form or clear zero powershield) are more acceptable.

Facial Lacerations

The facial laceration rate is seen in Table 4. Both goalie and nongoalie populations are represented.

Very few facial lacerations occurred in the LRHA. It is apparent that with increasing age and exposure, the facial laceration rate increased. The nongoalie WCHA laceration rate is reported as nearly five per man. The NHL nongoalie facial laceration rate is nearly 15 per man. It is a consistent finding that goalie populations have a lower facial laceration rate than nongoalie populations. The distribution of facial lacerations is presented in Tables 5A and 5B. The lower one-third of the face, including the lips, chin, and submental area, is consistently the most lacerated area with the forehead the next most frequently lacerated area in the nongoalie population.

Dental Loss

Table 6 presents the rates of dental loss in each of the populations studied. There is an increasing dental attrition with age and exposure and the NHL nongoalie players reported a mean loss of 2.2 teeth per man and approximately 1.9 teeth lost per man in the goalie populations.

Agents Causing Injury

In Tables 7A, 7B, and 7C, the distribution of agents which were reported to have caused injury are presented. The SPHS data is not shown because of space limitation, but is similar in distribution to the data which is presented. It is apparent that the most frequent cause of injury in the nongoalie population at all levels of play is the stick. The puck is the most significant cause of injury in the goalie population. Fighting did not appear to be a significant cause of injury in either the LRHA or the SPHS, however, it increased as an injury etiology through the WCHA and NHL.

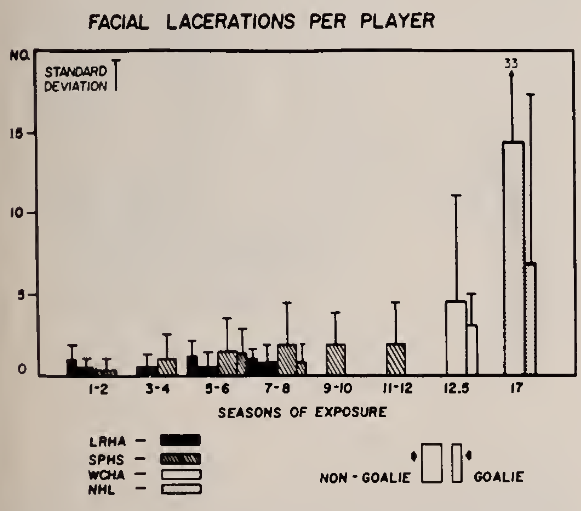
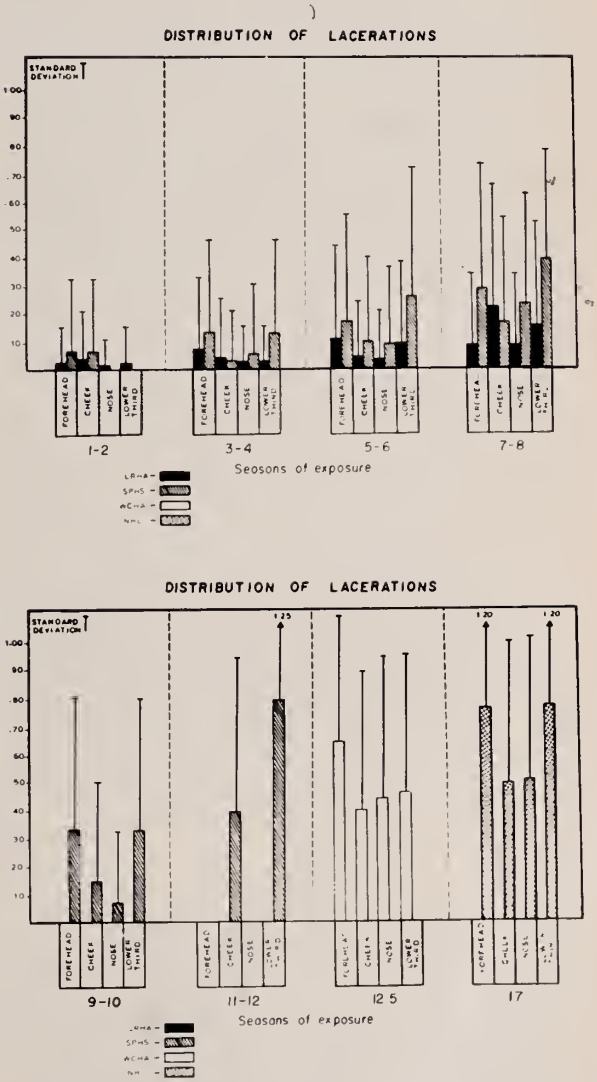


Table 4—Facial Lacerations. Table 4 shows the number of facial lacerations sustained per player. It is interesting to note that the goalie population has a consistently lower laceration rate than does the nongoalie population, though this difference is not statistically significant.

Facial Protection Acceptability

Table 8 presents the results of the question "Would facial protection, such as a mask, be acceptable to you?" It is apparent that the younger players demonstrate modest acceptability of facial protective equipment. It must be recognized



Tables 5A and 5B—Distribution of Lacerations. These tables show that the lower third of the face, including the lip, chin, and submental region, is consistently the most lacerated region in the face followed by the forehead.

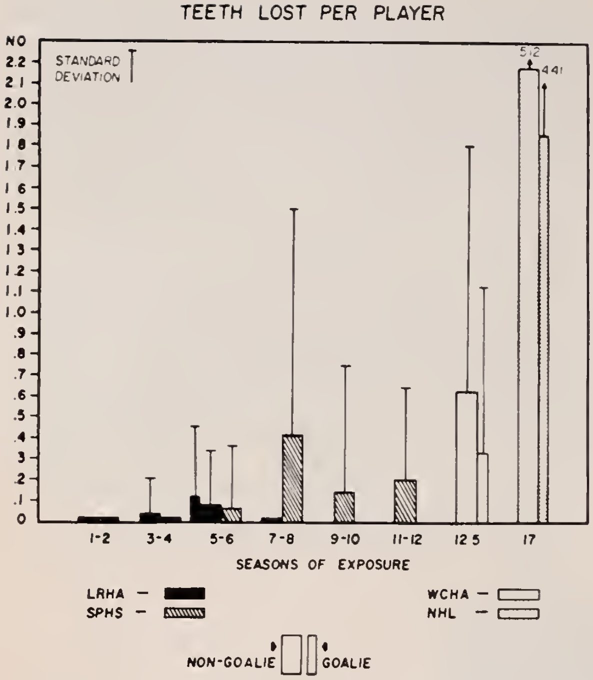


Table 6—Teeth Lost. This table shows the dramatic increase in dental attrition at the college and especially professional levels of play.

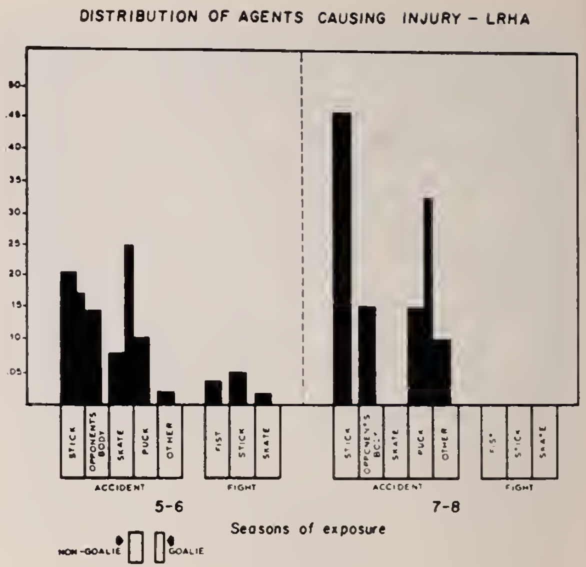


Table 7B

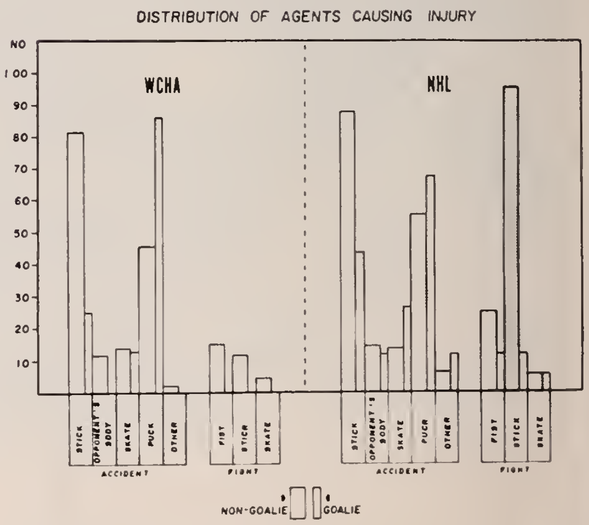


Table 7C

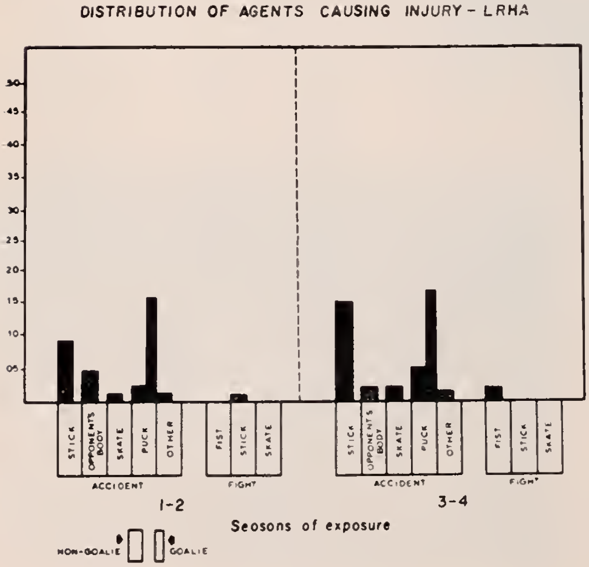


Table 7A

Tables 7A, 7B, and 7C—These tables show the distribution of agents causing facial injury. Except at the professional level, the vast majority of facial injuries are accidental. In the nongoalie population the stick is the most frequent cause of facial injury. In the goalie population the puck most consistently is the agent of injury.

that the rate for young LRHA players may represent parental bias since parental assistance in completing the questionnaire was required. There is a marked diminution in the acceptability of facial protection in the nongoalie population with increasing age and number of seasons of exposure. There is a nearly universal acceptability of facial protection in the goalie population at all levels. It should be pointed out here that while only three percent of nongoalie college players and nine percent of nongoalie professional players would find facial protective equipment personally acceptable, 23 percent of the college players and 60 percent of the professional players feel that "youngsters should use face masks and mouth pieces at all positions."

Discussion

The regulations recently passed by the Amateur Hockey Association of the United States as well as the Minnesota State High School League, are a reasonable first step in reducing the risk of facial injury in hockey. It is anticipated that the rate of facial injury in hockey will decline as it did in football when full facial protection (full face mask and mouth piece) became mandatory. Mandatory regulation is required to prevent injury to the occasional player who might wear a face mask in an optional setting and thus set himself apart from his team mates for "special attention" by the opposition. It is also required because of the lack of acceptability by older players as documented above. Full facial protection for all players must be "grown into."

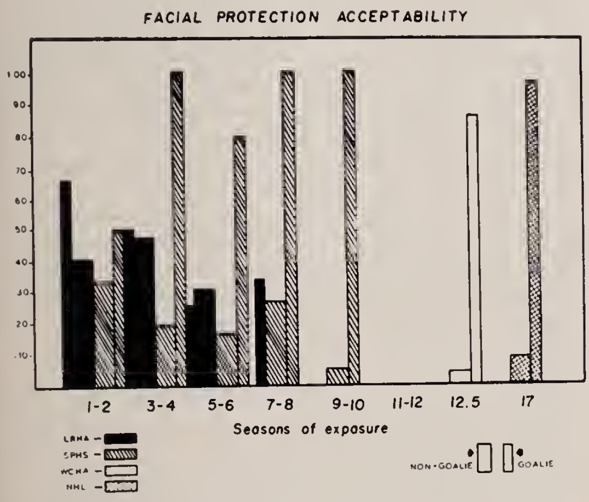


Table 8—Facial Protection Acceptability. This table presents the responses to the question "Would facial protection be acceptable to you?" It is interesting to contrast decreasing acceptance of facial protection demonstrated in this table with the preceding tables which show a consistent accumulation of facial injuries. It is interesting to note that facial protection is nearly universally acceptable to the goalie population.

The problem of which mask or mouth piece provides satisfactory protection has been dealt with for the past several years by the American Society for Testing and Materials F 8.15 Hockey Committee. This committee is drafting a national standard for acceptable hockey facial protective equipment. This standard covers both wire form and clear zero power shield (plastic) face masks as well as mouth pieces. The standard will apply industry-wide and it is anticipated that in 1977 face masks meeting this standard will be marketed and may be considered both safe and effective.

Mandatory facial protection is an important first step in reducing facial injuries, but several other measures are required as well. Attention must be payed to officiating at all levels, especially amateur, and efforts made to improve it. Violations such as high sticking must be discouraged and heavily penalized. Coaching at all levels must be evaluated. Instruction in the game's fundamentals and discouragement of currently popular intimidation techniques which are potentially dangerous, must be emphasized. It would be appropriate for leagues at all levels to establish ongoing safety programs to monitor injury rates. Only by continuously monitoring injury rates can governing boards respond appropriately to preserve the very worthwhile competitive aspect of North American Ice Hockey while providing a reasonably safe environment for the players.

Acknowledgments

John Connett, Ph.D., Biometry Department, University of Minnesota Health Sciences Center assisted in the design and carried out the statistical analysis of this study.

The authors wish to thank the following individuals and organizations for their assistance in the execution of this study: Mr. Dan Farrell, Hockey Coach, University of Michigan, National Hockey League, Western Collegiate Hockey Association, Department of Athletics, St. Paul High Schools, Board of Directors, Lake Region Hockey Association, Mrs. Judy Katzung, Librarian, St. Paul Dispatch and Pioneer Press.

References will be found on page 24.

Thrombotic Thrombocytopenic Purpura

Remission following Treatment with Aspirin and Dipyridamole

WILLIAM J. GUNDLACH, M.D.* and RALPH TARNASKY, M.D.†

This is the first case reported illustrating that aspirin and dipyridamole employed alone can induce and maintain remission in patients with thrombotic thrombocytopenic purpura.

THROMBOTIC THROMBOCYTOPENIC purpura (TTP) is a syndrome of fragmented red blood cell hemolytic anemia, thrombocytopenia, and fluctuating neurologic deficits. Fever and renal impairment are usually present as well. This relatively rare disorder is characterized morphologically by disseminated microcirculatory thrombosis.[1] Although current evidence[2-4] suggests that the pathogenesis of TTP involves diffuse platelet aggregation, it appears that few afflicted patients have been treated with platelet inhibitor drugs alone. We believe that our case is the first one reported of a patient successfully treated in such a manner.

Case Report

A 16-year-old girl who previously enjoyed normal health developed nausea, vomiting, watery diarrhea and lower abdominal cramping on February 5, 1976. On February 8, she was admitted to another hospital at which time she was afebrile and physical examination was normal. Her gastrointestinal symptoms cleared in seven days. On February 12, her Hbg was 11.6 and on February 14, she was icteric and complained of generalized weakness. Laboratory findings included: Hbg 6.3, WBC 15,000, platelets 15,000 and reticulocytes 6 percent. Blood and urine cultures were negative as was a direct and indirect Coombs test. She was given two units of packed red blood cells and 10 mg of intravenous dexamethasone and was transferred to our care.

On initial evaluation the patient was complaining of generalized weakness and numbness of the left arm. Physical examination revealed a pale, icteric, obese young female. A few small ecchymoses were present on the arms at previous venapuncture sites but no other purpura were evident. Physical examination was otherwise unremarkable including normal fundi and neurologic examination. No lymphadenopathy or hepatosplenomegaly was evident.

Initial laboratory findings included: Hbg 9:5, WBC 29,800 with 56 PMN's, 24 bands, 10 lymphs, 2 monocytes, 5 metamyelocytes and 3 myelocytes. Platelet count was 16,000 and reticulocytes 5 percent. The blood smear showed many fragmented RBC's with spherocytes and increased polychromasia. Plasma Hbg was 140 mg percent. Urinalysis showed 4+ albuminuria with hemoglobinuria, 10-12 RBC/hpf and hyaline and granular casts. The direct serum bilirubin was 2.4 mg percent with a total bilirubin of 4.6 mg percent. Serum creatinine was 2.2 mg percent. Thrombin time was 44 seconds with a control of 10.5 seconds and fibrin split products were present in the serum in excess of 40 micrograms per milliliter. A bone marrow biopsy showed 70 percent cellularity with one hyaline thrombus noted in a small blood vessel. There were increased numbers of megakaryocytes and erythroid hyperplasia was evident. Iron stores were depleted. Bone marrow smears showed normal granulocyte maturation.

Chest Xray, plasma fibrinogen, prothrombin time, PTT, sucrose hemolysis test, Ham test, Heinz body preparation, direct and indirect Coombs test, cold agglutinins, Monospot test, antinuclear antibodies, total serum complement, VDRL and SMA-12/60 were all normal.

Course

On the day of admission, the patient was placed on aspirin 900 mg every six hours and dipyridamole 100 mg every six hours. On the second hospital day the hemoglobin dropped to 7.6 gm percent. The patient received two units of packed red blood cells. On the fifth day, the Hbg was 10.7, WBC 9,200, platelets 45,000 and reticulocyte count 14 percent. On the eighth day the platelet count was 187,000 and on the tenth day the patient had no complaints and no icterus was evident. Hbg was 10.1, WBC 7,000, platelets 250,000 reticulocytes 6.8 percent, serum creatinine 1.4 mg percent, fibrin split products were normal and urinalysis showed only 1+

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albuminuria. Fragmented red blood cells were still evident on the peripheral blood smear. She was discharged on the tenth day on aspirin 900 mg/day and dipyridamole 400 mg/day and ferrous sulfate 900 mg/day. One month later her Hbg was 12.5, WBC 6,000, platelets 240,000 and reticulocytes 1.5 percent. No fragmented red blood cells were noted in the peripheral blood. After five months, the patient continues in remission on aspirin 900 mg/day and dipyridamole 300 mg/day.

Comment

The diagnosis of TTP was made by findings of fragmented red blood cell hemolytic anemia, thrombocytopenia, renal involvement and hyaline thrombi of small blood vessels in the bone marrow. She also complained of transient left arm numbness. No other causes of intravascular hemolysis were found and there was no definite evidence of disseminated intravascular coagulation present.

Discussion

TTP has a high mortality rate and is an uncommon disorder. Consequently, therapy has been mainly empirical. A host of treatment methods have been employed including corticosteroids, splenectomy, corticosteroids and splenectomy, heparin, exchange transfusion, hemodialysis and drugs that inhibit platelet function.[1,3,5-11]

In 1972 Schwartz et al.[12] reported that 72 percent of 32 survivors of TTP had been treated with a combination of corticosteroids and splenectomy. Until recently the latter form of therapy has been generally accepted as the most effective. Recent reports have demonstrated successful treatment of patients with TTP with regimens which included drugs that inhibit platelet function.[1,5-11] However many of these reported regimens included the use of heparin and splenectomy and all of them included corticosteroids. Nevertheless, in several instances, the addition of platelet inhibitory drugs to the regimen coincided with the onset of remission. The use of aspirin and dipyridamole in combination has been especially efficacious.[2,5,7,8,10] Our patient attained a remission by employing high doses of aspirin and dipyridamole without the concomitant use of corticosteroids, splenectomy or other medications. She continues in remission as of five months at the time of this writing.

Since the pathogenesis of TTP appears to involve diffuse platelet aggregation with the formation of platelet thrombi, the use of drugs which inhibit platelet function is a rational therapeutic approach.

Both aspirin and dipyridamole and many other drugs[13] are known to inhibit platelet function. Aspirin is well known to reduce the amount of collagen-induced platelet aggregation and the second phase of epinephrine and ADP-induced platelet aggregation[14] probably by inhibiting the platelet release mechanism. There is both experimental[15] and clinical[16] evidence that aspirin has antithrombotic properties.

The antithrombotic properties of dipyridamole were first reported by Emmons et al.[17] in 1965. They showed dipyridamole inhibited thrombus formation in the rabbit. There is also clinical evidence[18] that dipyridamole has antithrombotic properties but its mechanism is unclear. For example, administration of dipyridamole in maximum clinical dosage (400 mg/day) does not inhibit ADP or collagen-induced platelet aggregation[18] although higher concentrations do.[19]

Some studies[20] have demonstrated inhibition of platelet retention by dipyridamole. Sulfinpyrazone[21] is also a platelet inhibitor and has been successfully employed in patients with TTP.[1]

Summary

TTP is a syndrome probably induced by diffuse platelet aggregation leading to the formation of platelet thrombi in the microcirculation. Therefore, treatment of this disorder with drugs that inhibit platelet function is reasonable. Several previous reports have demonstrated their usefulness when used in conjunction with other therapeutic modalities.

This case illustrates that platelet inhibitory drugs employed alone can induce and maintain remission in patients with TTP.

Acknowledgments

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References

1. Neame PB et al.: Thrombotic thrombocytopenic purpura. Can Med Assoc J 114:1108, 1976.
2. Jaffe EA, Nachman RL, Merskey C: Thrombotic thrombocytopenic purpura—coagulation parameters in twelve patients. Blood 42:499, 1973.
3. Neame PB, Lechago J, Ling ET, et al.: Thrombotic thrombocytopenic purpura. Report of a case with disseminated intravascular platelet aggregation. Blood 42:804, 1973.

4-21. Will be found on page 63.

Intraoperative Management of Pheochromocytoma

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Because of the nature of the disease, surgically removing a pheochromocytoma presents problems. Some of these problems and their management are described in a case report of a 34-year-old woman operated on for this condition. The advantages of preoperative adrenergic receptor blockade and the importance of aggressive intraoperative fluid administration are emphasized.

DURING SURGICAL TREATMENT of pheochromocytoma, the integrity of the cardiovascular system is challenged by extreme fluctuations in plasma catecholamine levels. Frequently at induction of anesthesia and during tumor manipulation increased catecholamine release produces dangerous elevations of blood pressure and ventricular arrhythmias. When the venous drainage of the tumor is clamped cardiovascular collapse may ensue as catecholamines no longer enter the circulation from the tumor. There is considerable evidence that cardiovascular stability in the face of these challenges can be improved by preoperative adrenergic blockade.[1-4] Alpha receptor blockade modifies the elevations in blood pressure which occur during periods of excessive catecholamine release. It also allows reexpansion of the contracted plasma volume which together with intraoperative volume expansion decreases the likelihood that profound hypotension will follow tumor removal. The contribution of the anesthetic agent to cardiovascular stability is less certain since many agents have been used with similar success.[2-8]

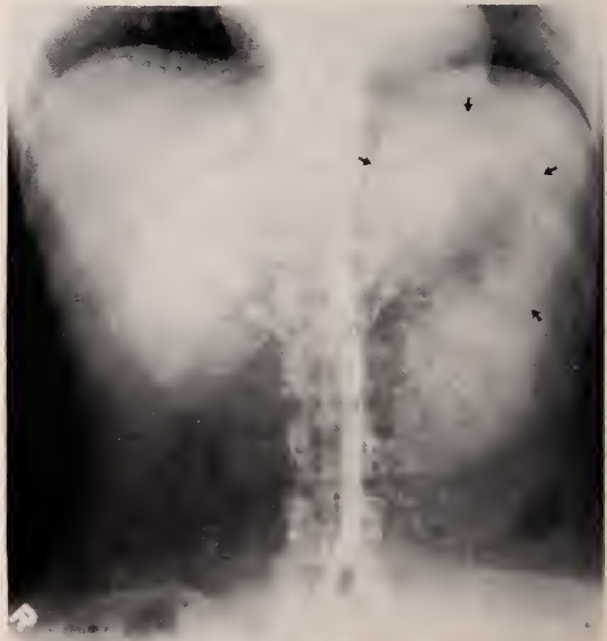
In the case to be described an uncomplicated intraoperative course resulted when preoperative alpha and beta adrenergic blockade, aggressive intraoperative fluid administration and enflurane anesthesia were employed.

Case Report

A 34-year-old woman was found to have asymptomatic hypertension and suspicion of the presence of pheochromocytoma was raised. Eighteen months prior to this diagnosis the patient developed an acute rise in blood pressure while undergoing a cholecystectomy. Only the systolic blood pressure was recorded, but this rose above 200 mm Hg. from her preinduction level of 140 mm Hg. No problems ensued. The patient again became acutely hypertensive during a subsequent pregnancy, which was successfully terminated by caesarean section because of placental insufficiency at 38 weeks gestation. The possibility of pheochromocytoma was considered.

A 24-hour urine collection obtained after this pregnancy contained 46.6 mg of vanillylmandelic acid (normal = 0.7-6.8 mg/24 hr.) and 33.9 mg metanephrines (normal = 0.3-0.9 mg/24 hr.). Other findings included a left supra-renal mass demonstrated by both intravenous pyelography and lumbar aortography (see Figure).

Initially treatment consisted of the alpha adrenergic



Figure—Abdominal aortogram showing left suprarenal mass demarcated by arrows.

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blocking agent, phenoxybenzamine, given orally in increasing doses to a total of 40 mg a day. Later, because the alpha receptor blockade caused tachycardia, the beta blocking agent, propranolol, was added to the regime. This was given to a total of 20 mg four times a day.

Prior to the institution of adrenergic blockade the patient's blood pressure was 182/122 mm Hg. The electrocardiogram showed evidence of left ventricular strain. Renal function tests were unremarkable. After six weeks on this regime the blood pressure stabilized at 140/90 mm Hg. and the pulse rate at 72/min. The electrocardiogram showed normal sinus rhythm, with previous evidence of left ventricular strain no longer present. Surgery was now scheduled.

Preanesthetic Assessment

The day prior to surgery the patient's hemoglobin was 15.1 gram % and the hematocrit 45.3%. The possibility that the plasma volume was still contracted in spite of prolonged alpha adrenergic blockade was considered. As preoperative hypovolemia may be an important factor contributing to the profound hypotension which sometimes follows tumor removal,[9] it was decided that blood and liberal quantities of lactated Ringer's solution would be administered in the early part of the procedure. Volume expansion would be considered adequate if a central venous pressure 4 to 5 cm H_2O above the preinduction level was attained before the tumor was removed.

Intraoperative Management

Following premedication with intramuscular droperidol 5 mg, fentanyl 0.1 mg and scopolamine 0.4 mg, the patient was brought to the preinduction room where the right radial artery was cannulated for continuous arterial pressure monitoring and blood gas estimations and a large bore venous catheter was placed. The right internal jugular vein was cannulated to monitor central venous pressure during surgery and the immediate postoperative period.

Prior to induction of anesthesia the blood pressure was 160/90 mm Hg., the heart rate 60/min. and the central venous pressure 9 cm H_2O. The electrocardiogram showed normal sinus rhythm. Three minutes after induction with 200 mg of thiopentone, the blood pressure rose to 240/110 mm Hg. and the pulse rate to 100/min. The electrocardiogram remained in normal sinus rhythm. A further 150 mg of thiopentone failed to correct this rise in blood pressure and 2.5 mg of the alpha adrenergic blocking agent phentolamine was then given intravenously. Within 30 seconds the blood pressure fell to 140/90 mm Hg.

Three minutes later, following a further 150 mg of thiopentone and 6 mg of pancuronium bromide, the patient was intubated without incident. Thereafter anesthesia was maintained with enflurane (1-2%) in nitrous oxide (60%) and oxygen. Following intubation the patient's urinary bladder was catheterized without incident. The patient was placed in the right lateral position carefully, but nevertheless there was another sharp increase in blood pressure to 210/110 mm Hg. The electrocardiogram remained in normal sinus rhythm and the heart rate was 90/min. The hypertension was again controlled with intravenous phentolamine 2.5 mg; phentolamine was required on two further occasions when the blood pressure rose above 200/100 mm Hg. and the pulse rate rose to 110/min. as the tumor was being manipulated.

Otherwise the blood pressure remained fairly constant at around 150/90 mm Hg. and the pulse rate steady at 80 to 90/min., from the time of incision until the time of removal of the tumor. During this interval of approximately one hour and forty five minutes the patient received 1,000 ml of whole blood and 1,000 ml of lactated Ringer's solution, which produced a rise in central venous pressure to 14 cm H_2O. Measured blood loss at this stage was 160 ml. The urine output averaged 40 ml per half hour. At one point it fell to 3 ml in a half hour and 5 mg of furosemide was given rather than infusing the patient with further fluid, as the central venous pressure was already more than adequate. The furosemide was administered with some concern however because pronounced diuresis would tend to reduce the blood volume and defeat the prime purpose of achieving a high circulating blood volume prior to tumor removal. The urine output returned to acceptable levels after furosemide.

Five minutes after removal of the tumor, the blood pressure fell to 100/70 mm Hg. and the central venous pressure fell to 4 cm H_2O. With the rapid transfusion of whole blood (1,000 ml), the central venous pressure rose to 12 cm H_2O and the blood pressure returned to 135/75 mm Hg. Blood loss for the procedure now measured 300 ml. Blood replacement was 2,000 ml. Search for ectopic tissue failed to reveal further tumor and the blood pressure remained at 135-145/70 mm Hg. until the patient awoke, at which time it rose to 170/80 mm Hg.

The patient was in pain and the blood pressure rise was controlled with intravenous demerol 25 mg. With the blood pressure stable at 135-145/80 mm Hg. and the central venous pressure stable at 8 to 12 cm H_2O, the patient was discharged to the intensive care unit where her postoperative course continued to proceed without complication. The hemoglobin concentration on the morning following surgery was 14.7 gram %.

Discussion

The relatively uncomplicated course described above can probably be attributed to the preoperative use of adrenergic blockade and to aggressive intraoperative fluid administration.[1-4] The possible contribution of the anesthetic agent enflurane should not be ignored, but many agents have been used with similar success in the presence of preoperative adrenergic blockade.[2-8]

The marked rise in blood pressure seen on induction of anesthesia and again during tumor manipulation, and the fall in blood pressure which accompanied tumor removal, indicate that adrenergic receptor blockade was incomplete in this patient. When complete blockade is achieved such fluctuations in blood pressure do not occur with changes in plasma catecholamine levels. In this respect it could be argued that total receptor blockade provides greater cardiovascular stability than does partial blockade. Partial blockade however has several distinct advantages. The patient is better able to counteract the hypotensive effects of thiopentone and hemorrhage. With a partial blockade, failure of blood pressure to fall following removal of the tumor may indicate the presence of a previously unsuspected satellite tumor. When located, palpation of the tumor will produce a diagnostic rise in blood pressure. Since the mortality associated with an undiscovered second tumor is high,[10] it is mandatory that the patient be able to respond in the above way.

The circulating blood volume in most patients with pheochromocytoma is probably normal.[2,3] Even so, aggressive intraoperative volume expansion—previously advocated on the grounds that circulating blood volume was low[9]—is still necessary to counteract the hypotension which accompanies tumor removal. In this case intraoperative fluid administration consisted of 2,000 ml of whole blood and 1,200 ml of lactated Ringer's solution. In view of a measured blood loss of 300 ml, this therapy although not unique,[2] might be considered overaggressive. The volume of fluid administered however resulted in normal and stable parameters of circulation at the end of the procedure and during the immediate postoperative period.

The practice of instituting alpha, but usually not beta adrenergic blockade prior to surgery in these patients, has been successfully used in conjunction with many anesthetic techniques. In many instances however, ventricular or supraventricular arrhythmias have still occurred.[2,4,5,8] The absence of arrhythmias in this case is therefore notable. It may be that pretreatment with the beta blocker, propranolol, was a contributing factor. Of greater significance may have been the use of the anesthetic agent enflurane. This idea is supported by Ortiz and Diaz who reported a similar experience with enflurane in a case in which preoperative beta blockade was not employed.[7] They reported only the appearance of a sinus tachycardia with handling of the tumor. Since that report Diaz has used the same anesthetic technique in two other cases without the development of arrhythmias.[11]

Debate as to the relative merits of different anesthetic agents in pheochromocytoma surgery continues. Preoperative adrenergic receptor blockade and intraoperative volume expansion are now well established. The stable intraoperative course described in this report is believed to have been due primarily to these factors.

References

1. Ross EJ, Prichard BNC, Kaufman L, et al.: Preoperative and operative management of patients with phaeochromocytoma. Brit Med J 1:191, 1967.
2. Sjoerdsma A, Engelman K, Waldman TA et al.: Pheochromocytoma: Current concepts of diagnosis and treatment. Ann Intern Med 65:1302, 1966.
3. Crout JR, Brown BR: Anesthetic management of pheochromocytoma: The value of phenoxybenzamine and methoxyflurane. Anesthesiology 30:29, 1969.
4. Perry LB, Gould AB: The anesthetic management of pheochromocytoma: Effect of preoperative adrenergic blocking drugs. Anesth & Anal. 51:36, 1972.
5. Joas TA, Craig D: Fluroxene anesthesia for pheochromocytoma removal. JAMA 209:927, 1969.
6. Cousins MJ, Rubin RB: The intraoperative management of phaeochromocytoma with total epidural sympathetic blockade. Br J Anaesth 46:78, 1974.
7. Ortiz FT, Diaz PM: Use of enflurane for pheochromocytoma removal. Anesthesiology 42:495, 1975.
8. Conner JT, Miller JD, Katz RL: Isoflurane anesthesia for pheochromocytoma: A case report. Anesth & Analg 54:419, 1975.
9. Brunjes S, Johns VJ, Crane MG: Pheochromocytoma: Postoperative shock and blood volume. New Eng J Med 262:393, 1960.
10. Stackpole RH, Melicow MM, Uson AC: Pheochromocytoma in children. J Pediat 63:314, 1963.
11. Diaz PM: Personal communication.

References

Facial Injuries in Hockey Players—Wilson et al. (Page 19)

1. AHAUS Committee on Safety and Protective Equipment: The importance of proper safety and protective equipment. U.S. Hockey-Biz, January, p 6, 1975.
2. Personal Communication, Amateur Hockey Association of the United States, Colorado Springs, Colorado.
3. Personal Communication, Minnesota State High School League, Anoka, Minnesota.
4. Horns Richard C: Blinding hockey injuries. Minnesota Med, Apr 59:4:255, 1976.
5. Pashby TJ and Pashby RC, Chisholm LDJ and Crawford JS: Eye injuries in Canadian hockey. Canadian Med Assn J 113:10:663, 1975.
6. Vinger Paul, 1975 Report on Facial Injury in Hockey: Massachusetts Secondary Schools—Personal Communication.
7. Action of Board of Directors, Minnesota State High School League, September 11, 1976, personal communication.
8. 1976-1977 Rule Book, Amateur Hockey Association of the United States, Colorado Springs, Colorado, Rule 23 C and D, pp 30-31.
9. Blyth CS and Mueller FO: An Epidemiologic Study of High School Football Injuries in North Carolina pp 73-74 1968-1972. Special Report. Funded by the U.S. Consumer Safety Commission.

Plasma Exchange by Continuous Flow Centrifugation

In The Management of Acute Renal Failure of Multiple Myeloma

I. E. FORTUNY, M.D.* and J. McCULLOUGH, M.D.†

Acute renal failure in multiple myeloma, previously thought irreversibly fatal, can be reversed by the removal of abnormal proteins, and significant survival can be obtained by specific chemotherapy. Two patients with multiple myeloma developed acute renal failure which was reversed by plasma exchange using continuous flow centrifugation. Successful control of the paraproteinemia and prolonged survival are the effects of a combination of cyclophosphamide, phenylalanine mustard and prednisone.

ACUTE RENAL FAILURE is considered a rare complication of multiple myeloma.[1] In the few reported cases of survival, treatment has consisted of peritoneal dialysis alone[2-7] or combined with plasmapheresis.[6] The mechanism by which abnormal proteins affect the kidney is not known,[1,5,7] however, tubular blockage by protein casts has been demonstrated.[1,5] Removal of protein seems to be of paramount importance in preventing further protein cast damage, and peritoneal dialysis has been shown effective in reversing renal failure.[5-7] Plasma exchange using the continuous flow centrifuge has been shown safe and effective[8] in removing significant volumes of plasma (4.5-7.5 liters) in a short time (2.5-4 hours). This report concerns two patients with multiple myeloma in whom acute renal failure was successfully treated by plasma exchange using the continuous flow centrifuge.

Plasmapheresis

The aminco celltrifuge is a continuous flow centrifuge through which the patient's blood is separated into plasma and its cellular components.[8] The system is closed, sterile and capable of processing the patient's total blood volume in three to four hours. After centrifugation the plasma and the cells are recombined and returned to the patient. In exchanging plasma, the patient's plasma is discarded and an equal volume of fresh frozen plasma (CPD) and plasma protein fraction (plasmanate) are recombined with the blood cells and returned to the patient.[9]

Case Reports

Case 1

The patient, a 40-year-old black housewife, presented with a three-week history of back pain, followed by bleeding from the gums. The hemoglobin was 7.0 gm/dl, the erythrosedimentation 75 mm/hr., the platelet count 130,000/mm^3, the blood urea nitrogen 75 mg/dl and creatinine 5.5 mg/dl. The urine specific gravity was 1.011 and hyaline-granular casts were present. The total serum protein concentration was 14.7gm/dl, a monoclonal gamma peak of 7.3 gm/dl (IgA 77 mg/dl, IgG 5,700 mg/dl and IgM 16 mg/dl). The bone marrow contained 22% abnormal plasma cells. Treatment with prednisone, cyclophosphamide and allopurinal was begun. The patient became anuric and plasma exchange by continuous flow centrifugation was carried out. A total of 5.0 liters of plasma were removed and replaced by 2.5 L fresh frozen plasma (CPD) and 2.5 L. of plasma protein fraction (plasmanate). Laboratory values before and after plasmapheresis are shown in the Table. The patient was placed on a regimen which included melphalan 0.15 mg/kg p.o. daily and prednisone 2 mg/kg p.o. daily for five days. Cyclophosphamide 8 mg/kg I.V. weekly was given for four weeks, after which the patient was rested for one month and the cycle repeated. One year later the patient is well, the BUN 24 mg/dl, creatinine 1.2

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mg/dl, creatinine clearance 72 ml/min, IgA 40 mg/dl, IgG 1550 mg/dl and IgM 25 mg/dl.

Case 2

This 60-year-old Caucasian male with IgA multiple myeloma was treated with daily oral cyclophosphamide for 36 months. An upper respiratory infection with a fever of 102°F prompted his admission to the hospital. The BUN was 64 mg/dl, creatinine 5.6 mg/dl, creatinine clearance 35 ml/min. Total serum protein 10.9 gm/dl, 5.4 gm/dl monoclonal peak (IgA 3800 mg/dl, IgG 125 mg/dl, IgM 36 mg/dl). The urine contained granular casts and heavy IgA chains. Over the next 24 hours the patient became oliguric (900 ml/24 hours) and plasmapheresis by continuous flow centrifugation was begun. A total volume of 5.5 L of plasma were removed and replaced with 3.0 L fresh frozen plasma (CPD) and 2.5 L of plasma protein fraction (plasmanate). The laboratory values before and after plasmapheresis are described in the table. Treatment with cyclophosphamide, melphalan and prednisone were begun. On the tenth day the creatinine clearance had returned to 46 ml/min, BUN 30 mg/dl, creatinine 2.4 mg/dl, and the patient was discharged from the hospital. Eighteen months later the patient continues asymptomatic, the creatinine clearance is 62 ml/min, the total serum proteins are 6.2 gm/dl with 3.02 gm/dl gamma globulin.

Discussion

Acute renal failure in multiple myeloma although of rare occurrence does not result in spontaneous recovery.[1] Volume depletion following intravenous pyelography,[2,5,6] hypercalcemia,[5,6] hyperuricemia,[6] transfusion reactions and congestive heart failure,[4] herald the development of renal failure. Volume depletion was not evident in our patients and the factors preceding the development of renal failure were a bleeding diathesis and upper respiratory infection.

Temporary recovery from acute renal failure has been described using peritoneal dialysis and specific myeloma chemotherapy,[5-7] suggesting that the removal of protein reverses the renal damage and when effective chemotherapy is added, survival is prolonged.

The recovery of these two patients from acute renal failure in the course of multiple myeloma supports the previous recommendations for active treatment.[1,5] The plasma exchange with the continuous flow centrifuge is another method to treat the condition. Rapid plasma exchange may be complicated by hypocalcemia, metabolic acidosis and citrate intoxication, all resulting from the ACD in fresh frozen plasma, however, replacement with fresh frozen plasma and plasmanate safely reduces such complications.[8]

The combination of cyclophosphamide, melphalan and prednisone has proven effective in controlling the excessive production of paraprotein in these two patients, resulting in significant survival.

Our experience indicates that plasma exchange by continuous flow centrifugation is a safe and effective method to remove large amounts of abnormal protein in a short time and thus reverse acute renal failure, secondary to renal tubular damage and hyperviscosity complicating multiple myeloma. With the institution of effective chemotherapy and early plasma exchange, recovery of renal function can be preserved and survival lengthened.

TABLE
Acute Renal Failure in Multiple Myeloma*

	Patient #1			Patient #2		
	Before Exchange	4 hrs after	5 days after	Before Exchange	4 hrs after	5 days after
BUN (mg/dl)	75	58	28	110	112	83
Creatinine (mg/dl)	5.5	3.6	2.4	7.8	5.0	3.2
Creatinine Clearance (ml/min)	20	—	60	16	—	26
Total Proteins (gm/dl)	14.7	10.8	8.4	10.9	8	6
Albumin (gm/dl)	3.2	3.0	3.0	4.0	4.0	3.6
Globulin (gm/dl)	7.3	5.5	3.6	5.4	3.5	3.9

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*Laboratory values before and after plasma exchange.

References

1. Rees ED and Waugh WH: Factors in the renal failure of multiple myeloma. Arch Int Med 116:400, 1965.
2. Bartels ED, Brun GG, Gammeltoft A and Gjöurp PA: Acute anuria following intravenous pyelography in a patient with myelomatosis. Acta Med Scand 150:297, 1954.
3. DeFronzo RA, Humphrey RL, Wright JR, Cooke CR: Acute renal failure in multiple myeloma. Medicine 54:209, 1975.
4. Walter J, Mantz J, Batzenschlager A and Maurer M: Anuries revelatrices d'une maladie de Kahlee. Strasbourg Med 11:418, 1960.
5. Bryan CW and Healy JK: Acute renal failure in multiple myeloma. Am J Med 44:128, 1968.
6. Yium J, Martinez-Maldonado M, Eknoyan G and Suki WN: Peritoneal dialysis in the treatment of renal failure in multiple myeloma. S Med J 64:1403, 1971.
7. Booth LJ, Minielly JA and Smith EKM: Acute renal failure in multiple myeloma. CMA Journal:111:334, 1974.
8. Crandall L, Fortuny IE, McCullough J and Kennedy BJ: The cell separator, a continuous flow centrifuge for blood component collection. Minnesota Med 56:759, 1973.
9. McCullough J, Fortuny IE, Branda RF, Edson RE, Kennedy BJ: Rapid plasma exchange using the continuous flow cell separator. Transfusion 13:94, 1973.

Microvascular Surgery

The Application

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Microvascular surgery is an exciting new technique that is finding new applications for the transfer of free flaps from one part of the body to another and for the replantation of severed parts. The technical aspects of operating in this "new world" of surgery are important. The refinement and utilization of these techniques offer us a real challenge for the future.

AMONG THE MORE EXCITING advances in operative surgery during the past two decades, and currently in its infancy, is the concept of microvascular surgery. This has opened up a whole "new world" of surgery—the world of operating through the microscope. Ironically, during the early years, many of those who grasped its potential applications were outside the field of surgery. Basic science investigators or their technicians mastered the techniques and applied them on a wide scale, especially in the area of the immunologic aspects of organ transplantation.

Microvascular surgery creates an illusion, making "life-size" to the eye, structures that are less than 1 mm in diameter, and brings these structures into the range of operability. Unfortunately, what is large to the eye remains small to the hand, making technical development a matter of considerable patience, concentration, and coordination. The operative field is extremely small; the instruments are delicate, minute, and of unconventional design in some cases; and the tissues are fine and often fragile.

These factors require that hand movements be slow, gentle, and limited in scope since all motion is proportionately magnified under the microscope.

Application

Although the laboratory applications of microvascular surgery are almost unlimited (with the added benefit of cost reduction through the use of smaller, less-expensive animals as models for operative experimentation), the final value of any advance is related to its usefulness in the clinical situation. Here, too, the horizons are broadening. Neurologic, hand, and otolaryngologic surgeons have, for several years, been employing the microscope to refine the dissection and repair of very fine structures, as exemplified in the anastomosis of very small nerve grafts on a fascicular basis and the improvement of hearing by operations on the moving parts of the middle ear. More recent applications have been the replantation of severed parts and the transfer of free islands of tissue with a distinct blood supply from one part of the body to the other.

Free Flap Transfers

By traditional methods, the moving of tissue from one part of the body to another requires the presence of a vascular pedicle until the tissue can develop a new blood supply from its recipient site. Usually, this necessitates two or more operations, with one to three weeks between operations. Microvascular surgical techniques make possible the transfer of sizeable bodies of tissue in a single operation, thus reducing the time in the hospital. In most cases, these free tissue grafts consist of skin and subcutaneous tissue, but they may also include muscle or bone. The first such successful free tissue transfer performed clinically was reported by Daniel and Taylor[1] in 1973.

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Since then, successful results have been reported by others.[2-7]

The requirement for the flap donor area is a known and consistent arteriovenous system with vessels sufficient for microvascular anastomoses, nourishing a large enough mass of composite tissue to be useful. Suitable flaps fulfilling these requirements are the groin flap and the deltopectoral flap.

The groin flap (Figure 1) is based on the superficial circumflex iliac artery and vein and on the superficial inferior epigastric artery and vein.[8,9] The former vessels are more constant and dictate the design of the flap. The axis of the flap runs parallel to and just below the inguinal ligament. The upper and lower borders may extend 5 cm (or in some cases more) above and below this axis. The medial border is the femoral artery, and the lateral border is the anterior superior iliac spine. The flap may be elevated from lateral to medial or vice versa, but the former imposes less risk of injury to the supplying vessels. Elevation is subfascial, as the superficial circumflex iliac artery runs subfascial laterally to the lateral border of the sartorius where it becomes more superficial. The portion of the flap that is lateral to the sartorius therefore may be thinned if desired. When the flap has been elevated and the anatomy of the vascular pedicle defined, one or both vessel systems may be used and the flap tailored if necessary. The resultant groin defect is either closed or skin-grafted.

The deltopectoral flap (Figure 2), originally described by Bakamjian[10] as a medially based pedicle flap, has been used as a free flap, but it is less adaptable than the groin flap because more supplying vessels are involved—the second, third, and fourth anterior thoracic perforators; and there is some variation in the dominant vessels, more commonly the second. Also these vessels are smaller than the vessels used in the groin flap. The cosmetic defect on the chest is more noticeable than in the groin flap. The upper border of the deltopectoral flap is the clavicle; the lower border is the fifth rib; the medial border is 2 cm lateral to the edge of the sternum; and the lateral border is the deltoid muscle. Some variation, depending on need, is possible. In selecting the lateral border, the vascular anatomy of the area must be considered. The anterior thoracic perforators arise from the internal mammary artery, pierce the fascia about 1 cm lateral to the sternum, and then course laterally on the fascia to the medial margin of the deltoid muscle. The portion of the flap that is over the deltoid is then supplied by a more tenuous, random, musculocutaneous

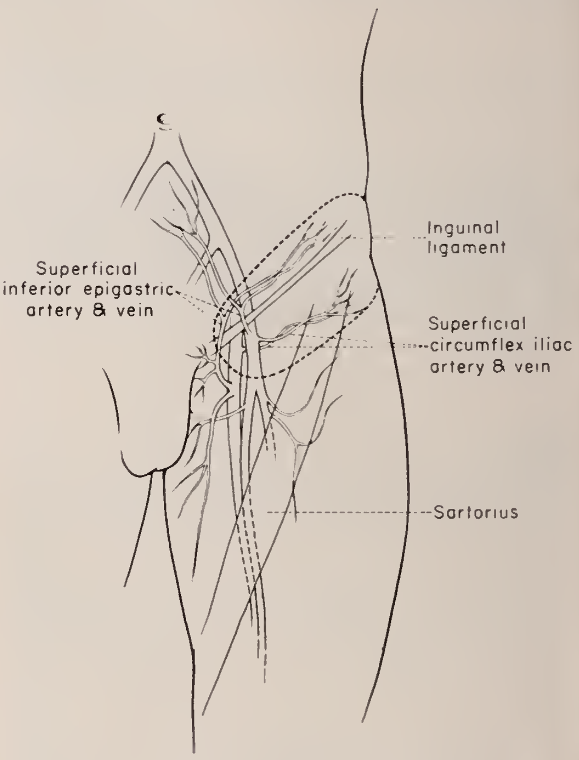
Superficial inferior epigastric artery & vein
Inguinal ligament
Superficial circumflex iliac artery & vein
Sartorius

Fig. 1—Anatomic illustration of groin flap.

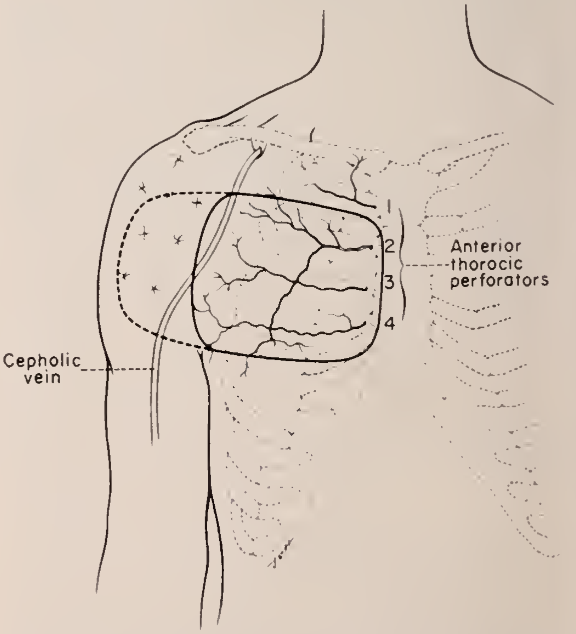

Fig. 2—Anatomic illustration of deltopectoral flap.

blood supply. The deltopectoral flap is best raised from lateral to medial in the subfascial plane, with intraoperative selection of the dominant perforators. The chest defect is then skin-grafted. Requirements for the recipient area are to have vessels that are known and consistent, large enough for microvascular anastomoses, and adjacent to the recipient site, which can be utilized without being damaged.

Replantation

The first successful replantation of a severed digit was reported in 1968 by Komatsu and Tamai.[11] Snyder et al.[12] in 1972 reported replanting a completely severed thumb. O'Brien et al.[13] in 1973 reported replanting 31 digits: 21 completely severed (62% survival) and 10 incompletely severed (100% survival). Digital replantation should be considered in multiple digit injuries or in single amputations of the thumb and index fingers. Replantation probably should not be considered when there is gross crushing, significant loss of tissue, or multiple fractures.

Technical Aspects

Magnification

Magnification of two to 4.5 power can be obtained with special glasses (Figure 3A). Magnification of eight to 20 power can be obtained with an operating microscope (Figure 3B). As the magnification increases, the picture becomes clearer but the field becomes smaller and more compensation is needed between the eyes and the hands. Therefore, the magnification selected should be just large enough to give a clear picture.

Instruments

Instruments should be as simple as possible. Jeweler's forceps, fine scissors, needle holder, and small vascular clamps are the essential instruments (Figure 4). Instrument tips should be fine and precise. They often have to be custom ground by the user to suit his needs. Many of the pioneers in this field of surgery have designed their own instruments[14-16] but adequate instruments are gradually becoming available on a commercial basis. The instruments should fit comfortably in the hand, much like a pencil. Ancillary instruments are a bipolar cautery, suction, and an irrigating apparatus.

Sutures

Sutures should be fine monofilament swedged on a fine needle. They should be shorter than an ordinary suture because of the limited field

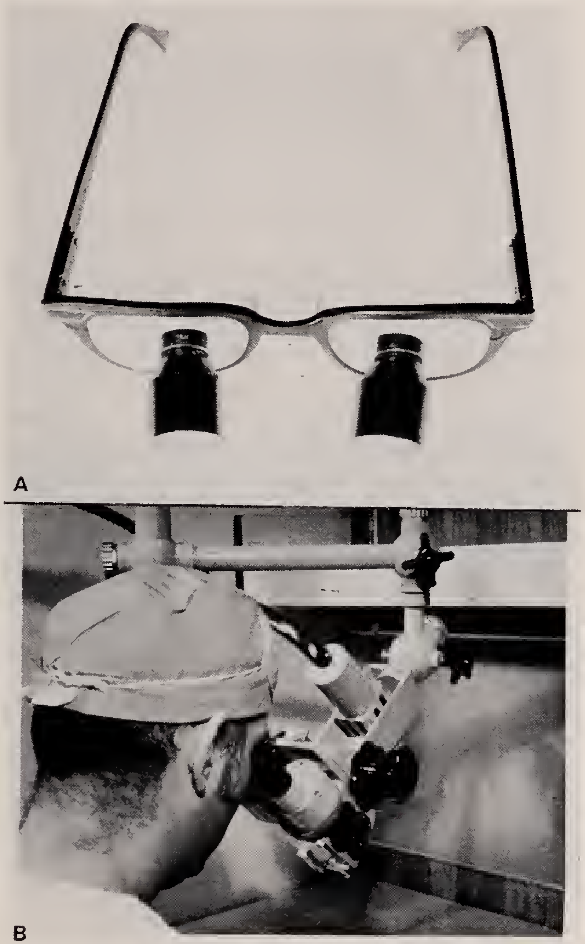

Fig. 3—(A) Special glasses for magnification. (B) Operating microscope.

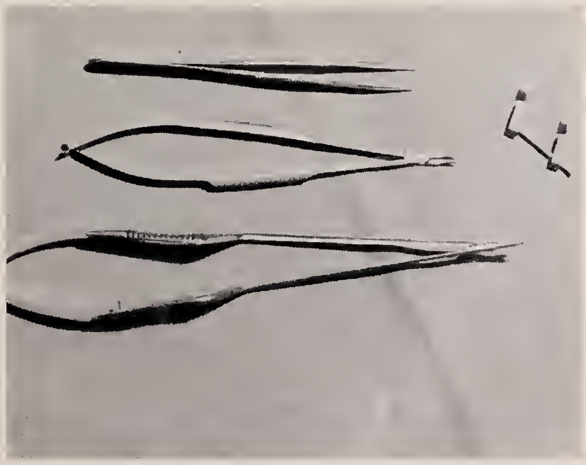

Fig. 4—Basic instruments for suturing.

of vision. Ten centimeters is an ideal length. The needle should be as near the size of the sutures as possible. The cord length should be 3 to 5 mm. A ⅜ circle needle is the most common type, although a straight needle has the advantage of being ready to use when it is picked up with an instrument, whereas the curved needle has to be turned a particular way. For the suturing of vessels in the 1-mm size range, a satisfactory suture would be a 10-0 (0.025 mm) monofilament, 10 cm long swedged onto a taper needle 0.075 to 0.100 mm.

Suturing

The operator should be in a comfortable position with the hands resting on something stationary. Coffee or other stimulants before surgery may cause a slight tremor, which is best avoided. Noise that might interfere with the operator's concentration should be minimized. The anastomosis should be performed by use of as few sutures as necessary to hold the ends together and to control bleeding from the suture line (Figure 5). Generally, more sutures are needed to control bleeding than to provide holding strength, but the number of sutures can be reduced by covering the suture line with a cuff of Saran Wrap or Silastic tubing temporarily until the small gaps in the suture line are sealed by the products of coagulation.[17,18] A minimum number of sutures is four, but six are more generally used. The technique of eccentric bi-angulation, as described by Cobbett,[19] seems to be a satisfactory method of placing the sutures.

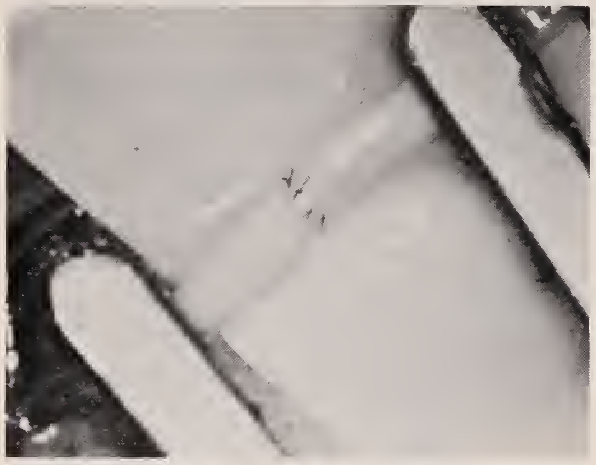

Fig. 5—Arterial anastomosis.

Assuming that an accurate anastomosis is made, the next problem with these tiny vessels is thrombus formation. The triggering factor to thrombus formation seems to be exposure of collagen to the vascular stream. Acland[20] demonstrated that injuries to the vessel from stripping the adventitia and pinching, pulling, clamping, or pressing on the intima caused little or no thrombus, whereas a small incision in the intima produced thrombus. Therefore, care should be taken to prevent the exposure of collagen to the bloodstream. The adventitia should be stripped back from the vessel ends and the intima kept intact. If collagen is exposed, platelet thrombus develops. Attempts to control this with magnesium sulfate locally[21] and Pluronic F68 systemically[22] have been promising experimentally. Heparin has little effect on the platelet thrombus.

References

1. Daniel RK, Taylor GI: Distant transfer of an island flap by microvascular anastomoses: a clinical technique. Plast Reconstr Surg 52:111, 1973.
2. O'Brien BM, MacLeod AM, Hayhurst JW, et al.: Successful transfer of a large island flap from the groin to the foot by microvascular anastomoses. Plast Reconstr Surg 52:271, 1973.
3. Harii K, Ohmori K, Ohmori S: Successful clinical transfer of ten free flaps by microvascular anastomoses. Plast Reconstr Surg 53:259, 1974.
4. Kaplan EN, Buncke HJ, Murray DE: Distant transfer of cutaneous island flaps in humans by microvascular anastomoses. Plast Reconstr Surg 52:301, 1973.
5. Harii K, Ohmori S: Use of the gastroepiploic vessels as recipient or donor vessels in the free transfer of composite flaps by microvascular anastomoses. Plast Reconstr Surg 52:541, 1973.
6. Goldwyn RM: Discussion. Plast Reconstr Surg 53:469, 1974.
7. Ostrup LT, Frederickson JM: Distant transfer of a free, living bone graft by microvascular anastomoses: an experimental study. Plast Reconstr Surg 54:274, 1974.
8. Smith PJ, Foley B, McGregor IA, et al.: The anatomical basis of the groin flap. Plast Reconstr Surg 49:41, 1972.
9. McGregor IA, Jackson IT: The groin flap. Br J Plast Surg 25:3, 1972.
10. Bakamjian VY: Cited by Smith PJ, Foley B, McGregor IA, et al.[8]
11. Komatsu S, Tamai S: Successful replantation of a completely cut-off thumb. Plast Reconstr Surg 42:374, 1968.
12. Snyder CC, Stevenson RM, Browne EZ Jr: Successful replantation of a totally severed thumb. Plast Reconstr Surg 50:553, 1972.
13. O'Brien BM, MacLeod AM, Miller GD, et al.: Clinical replantation of digits. Plast Reconstr Surg 52:490, 1973.
14. Acland R: A new needle for microvascular surgery. Surgery 71:130, 1972.
15. Zirkle TJ, Seidenstricker KL: An adjustable double clamp for use in microvascular surgery. Plast Reconstr Surg 51:340, 1973.
16. O'Brien BM, Hayhurst JW: Metallized microsutures and a new micro needle holder. Plast Reconstr Surg 52:673, 1973.
17. McLean DH, Buncke HJ Jr: Use of the Saran Wrap cuff in microsurgical arterial repairs. Plast Reconstr Surg 51:624, 1973.

18-22. Will be found on page 63.

Coping with Coronary Heart Disease

A Pastoral Care Approach

FATHER JAMES D. DEEGAN, O.M.I.*

IN THE FALL OF 1975, Dr. Jose Canto, Cardiologist, established a Cardiac Rehabilitation Program at Divine Redeemer Memorial Hospital. Since Dr. Canto wanted this venture to be a total program to meet the needs of the entire person, and which would use services of health care team members, he asked me to develop a program to deal with emotional and psychological aspects of coronary heart disease.

As a result, I prepared a program that consisted of meeting with coronary patients and their spouses for four consecutive Monday evenings. After reading the available research in this area, I started with the premise that, while stress and anxiety may or may not have played a role in developing coronary heart disease, its proper management following a heart attack would aid in adjusting to the attack and help in preventing recurring coronary problems.

Human Processes

Change and growth as a person have always been difficult human processes for man. For our consideration I would like to focus upon a method advocated for spiritual growth in religious communities. The method is called "Consciousness Examen."[1] The dynamics of this method are quite simple. Individuals desiring to grow spiritually are encouraged to set aside a specific period of time each day in which they examine themselves in regard to their specific behaviors and states of mind. The thinking is that this specific, consistent self-confrontation provides a concrete means of self-assessment in an otherwise nebulous area.

These same dynamics are present in many different forms in our present day culture. The Alcoholics Anonymous program uses it in their tenth step when they encourage their members to "take a personal inventory" on a daily basis to make certain they are not reverting to previous patterns of thinking and feeling that facilitated their drinking.[2]

Sessions

With this in mind, four sessions were established for the coronary patients and their spouses. Each group was limited to four couples so that meaningful interaction could take place. The session would begin with the group leader giving didactic input on the topic to be considered for that evening. This was followed by group interaction where the goal was to allow the people involved to verbalize their own feelings and experiences on the topic.

First Session

During the first session the didactic focused on stress factors and description of the Type A personality as delineated by Friedman.[3] The couples were then asked to verbalize their perception of stress factors in their lives.

This type of sharing often proved to be a very liberating experience for both the coronary patients and their spouses because both seemed to feel they were "alone" in the feelings they experienced. At the end of the session, the patients and spouses were given worksheets to take home for consideration during the week. On this worksheet were three vertical columns. The first column was for listing specific stress factors, the second column for listing previous behavior that facilitated the stress and the third column was for listing new behaviors which would help ameliorate the stress. The patients and spouses were asked to fill these out during the week and discuss their findings with one another.

Second Session

The focus of the second session was on value clarification. Usually when a person goes through a loss process there is a reshuffling of values. It is very common to hear a patient say something to the effect that, "I'm going to spend more time with my family; making money and getting ahead

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See editorial, page 35.

is not that important." In the opening didactics we spoke about the importance of being responsible about choosing one's own values, keeping them updated and not allowing outside elements, such as society, to make these determinations. Each person was asked to examine the harmony that exists between their values and behavior and if they find a great disparity, then they should consider modifying either their values or behavior. When values and behavior are in harmony with one another, then more effective living is possible, along with a more appropriate management of stress and anxiety. Group members were then given a worksheet for the following session which they were asked to complete and share with their partners. The first column on the worksheet asked them to identify previous values. The second column asked for present values and the third column asked for behaviors and attitudes which will accompany their present values.

Third Session

In the third session we focus upon communication with the significant other, which is usually the marital spouse. Very often we see that the emotional trauma which the spouse and family experience is much more dramatic, incapacitating and long lasting than that which the coronary patient experiences. Communication techniques and the importance of sharing with significant others the emotional impact of what they have experienced is emphasized. Many times at a crisis time we find that with proper help the partners can achieve a new closeness and deepening of their relationship. Through more effective communication it is hoped that dependency, invalidism, fear, anxiety, etc. can be brought within appropriate limits. The goal is more effective and genuine communication, which makes for more effective living, and again makes for the more effective management of stress and anxiety.

Each person is given another worksheet to reflect on during the following week. It asks the person to identify specifically areas which need to be discussed in the relationship and to affirm specifically the positive elements of the relationship and share their conclusions with one another.

Fourth Session

In the fourth session the didactics stress the need for consistent specific self-assessment. In congruency with the other phases of coronary rehabilitation, it is stressed that, like appropriate exercise and eating habits, change is only meaningful if it constitutes a new lifestyle, rather than a fad to be discarded when the anxiety from the crisis abates. Thus, the patient and spouse are given a final worksheet on which they make a synthesis of three elements which they feel at the present time they need to consistently assess themselves on.

Group Process

In the group process, one of the coronary-trained nurses assists the leader in developing the group interaction. The nurse plays an important part because she has established a relationship with the patients while monitoring their heart rates in the exercise phase of the rehabilitation program. During this phase the patient will very often vent feelings quite spontaneously which will differ from the type of responses which the patient will give in the presence of their spouse and the group. The nurse is able to help the patients be aware of the discrepancies in their responses. The group experience of rehabilitation has the predictable experience of liberation: "There are others experiencing what I am experiencing." Likewise, the couples usually provide a learning model for one another as they attempt to identify areas of struggle and resolution of more appropriate coping techniques.

Follow-up

As a follow-up to this process a coronary club has been established which meets on a monthly basis and provides a forum for dispensing and reinforcing accurate information on various factors of coronary heart disease. A very important part of these meetings is allowing people to continue to verbalize their feelings over what has happened to them and their families in the adjustment process.

This writer would welcome responses of any nature to this article. I would like to thank Dr. Robert G. G. Bjornson, M.D., for his encouragement and assistance in preparing this article for publication.

References

1. Aschenbrenner George A. S.J.: Consciousness Examen, Review For Religious, 31:1, pp. 14-21, January, 1972.
2. Twelve Steps And Twelve Traditions: Alcoholics Anonymous World Services, Inc., pp. 90-98, 1952.
3. Friedman Meyer, M.D., Rosenman Ray H, M.D.: Type A Behavior And Your Heart, Alfred A. Knopf, Inc., New York, New York.

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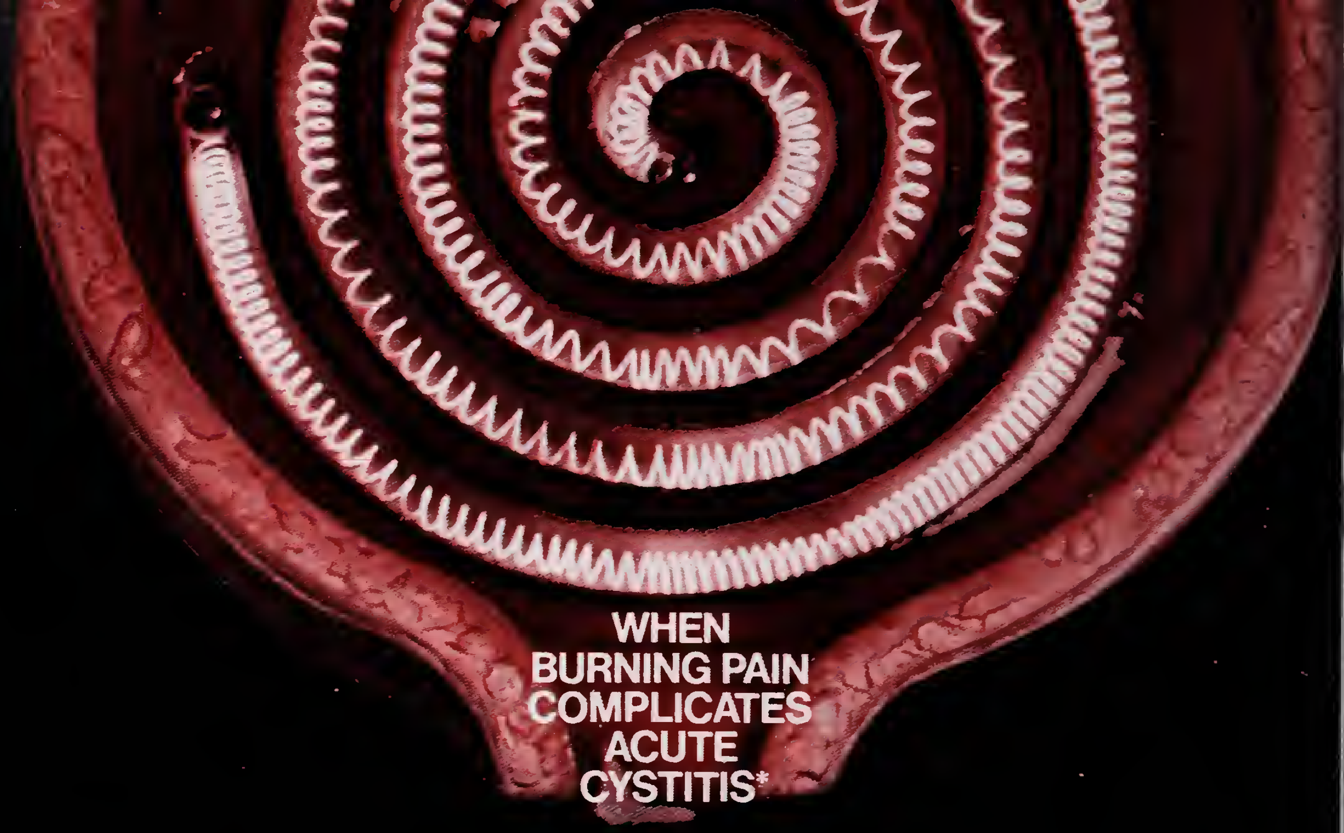

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Editorials

Oncology Support Groups for Out-Patients*

PHYSICIANS WHO DEAL with the care of patients should plan their treatment protocol, not only to include the acute phases of the disease, but the extended or convalescent phase of the disease process. This is especially true of patients with chronic disease processes, where multiple facets of convalescence must be taken into consideration. The patient's family, and also his work, should be included in planning convalescence. In doing so, physicians should acquire a great deal of personal information regarding their patients.

Physicians are utilizing the services of nursing personnel, public health nurses, as well as social service and other support facilities that hospitals make available in attempting to deal with the total concept of care for their patients. In this journal, Baker describes three such support groups for cancer patients receiving their chemical therapy. These have been set up to be run primarily by the people involved, with support from the para-medical, and/or medical personnel at those institutions. Patients with similar ailments may help discuss problems that they had in treatment or convalescence. Families of these patients may also be helpful in discussing similar types of problems in helping these patients bridge their gap between the acute hospitalization and the convalescent phase of their illness. It seems especially important to keep the groups unstructured as Karen Baker describes, and give the patients a chance to discuss among themselves the various problems that they have encountered.

Multiple hospitals in the Twin Cities area are currently attempting to set up support groups for their patients. In addition the American Cancer Society is formulating a support group for cancer patients that would be county wide in its scope and not be limited to patients at any one hospital.

It is the responsibility of the physicians who treat patients with cancer, to take into account the total spectum of that patient's illness, and to encourage participation in support groups if they exist. If support groups at the individual hospitals do not exist or are not operable, physicians should be among the leaders in formulating such groups to be operative. We would encourage physicians in all hospitals to utilize the services available to them and to plan for discharge services far before discharge is set up. It is with the help of such support groups and discharge planning that the ultimate care of the patient with serious disease will be improved.

Neil Hoffman, M.D.
Minneapolis, Minnesota

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*See page 67.

Help for the Asking from Pastoral Care

SEEK AND YE shall find. Ask and ye shall receive. It seems we might wisely follow this advice when in need of help with, among other things, restructuring of life patterns in patients recovering from myocardial infarctions (see the report in this issue from Father James Deegan of Divine Redeemer Hospital in South Saint Paul*).

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*See page 30A.

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Pastoral care departments are often able and willing to help the physician in ways of which the physician seems unaware. How familiar are we with what our pastoral care departments offer? How much and how well have we shared with them the kinds of information about our patients which would enable them to help those patients? And how often have we sought out our pastoral care staff and really asked their help? How much concern do we express for those aspects of our patients' lives which might be helped more by pastoral care staffs than by medical staffs?

Our interest in helping the "whole patient" often leads to impossible demands on our time and our counselling skills. If help is to be provided, it must be found elsewhere—and the Pastoral Care Department seems a fine place to begin. Seek there and ye shall likely find; ask there and ye shall likely receive.

R. G. B. Bjornson, M.D.
St. Paul, Minnesota

Management of the Pregnant Diabetic

I CONGRATULATE Drs. Coniff and Maeder* for a thoroughly researched, well written, and concisely organized paper. For a predictably good outlook, a team approach, including pediatrician, certainly should be considered as accepted community practice.

Hydramnios, listed in Table 2, can be an extremely troublesome pregnancy complication. Diabetic patients may have to be placed at bedrest, thereby decreasing insulin requirements, or may have to receive repetitive amniocentesis for fluid removal. This could cause infection and thereby increase insulin requirements. A brittle state is indeed present.

Placental lactogen has been used specifically to predict placental integrity by some, but results have not been universally accepted. Current thinking dictates intrauterine fetal monitoring as a means for best fetal outlook. Ultrasound may have a place with serial estriol levels, oxytocin challenge testing, LS ratios, and amniotic creatinine levels in predicting fetal maturity and welfare.

Hospitalization for diabetic stabilization prior to delivery certainly has merit. Dr. Ralph Dolkart, a Chicago proponent of six hour management for any diabetic crisis, would certainly advise similar treatment for insulin-dependent pregnant females. Considering fetal fragility during the last five to six weeks of pregnancy, and abrupt changes in maternal insulin requirements immediately postpartum, six hour regular insulin management may continue to have a place in the obstetricians and internists armamentarium for treating this disease. Only by using all accepted procedures at our disposal will fetal mortality and morbidity rates be decreased.

James M. Mueller, M.D.
Edina, Minnesota

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*Coniff RF and Maeder EC: Management of the pregnant diabetic. Minnesota Med 59:11:772, 1976.

Diagnosis of Mild Diabetes

As WITH MOST DISEASE processes, there are florid examples and then there are the borderline conditions. Diabetes mellitus is one such condition which there are many gray zones between the florid and the non-florid. Because of its socioeconomic implications, diabetes should not be a diagnosis unless there are no doubts.

Dr. Nuttal, in his article,[1] points out the problems both with definition of diabetes and the problems of chemical analysis for glucose. It is very important that the normal ranges for each laboratory be known by the interpreter of these chemical tests.

Steinke and Thorn, in Harrison's Principles of Internal Medicine, 7th Edition, gives the following definition for mild diabetes mellitus, "Chemical or asymptomatic diabetes: The fasting glucose level is usually normal, but the postprandial level is frequently elevated. The results of an oral or intravenous glucose test performed in absence of

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stress is clearly abnormal."[2] Their suggestion is that the fasting blood sugar be less than 100, half hour less than 170, one hour less than 170, two hours less than 120 and three hours less than 110. They also state that there should be no glycosuria. However, as a person ages, they increase the two hour postprandial blood sugar by 10 mg. percent for each decade over age 50.

It is very important to make the diagnosis of diabetes, even in a mild state, as there are suggestions that strict control of the diabetes will make a difference in the progression of the disease.[3]

Gene R. Hartmann
Minneapolis, Minnesota

References

1. Nuttall FQ: Diagnosis of mild diabetes. Minnesota Med 59:11:-747, 1976.

2. Steinke J and Thorn GW: Harrison's Principles of Internal Medicine. Seventh Edition. McGraw and Hill Book Co., p 533, 1974.

3. Diabetes 25:3, March, 1976.

Memorials

> *Maimonides Luke, M.D. has joined his forebears after 45 years of service to the people of Elysian Fields, Minnesota. His cheerful presence and kindly ministrations will be sorely missed by the many patients, friends and family members who grieve him. He was, as the Irish say, a lovely man who will not soon be replaced. The family prefers that memorials be dedicated to the Student Loan Fund of the Minnesota State Medical Association Foundation.*
>
> Elysian Fields Argus, January 1, 1977

What a splendid memorial to a deceased physician! The subject of memorials is a sensitive one even though we are aware every day of the flow of life, of our own fragility as well as our strength, and of our ultimate mortality.

Physicians are often present at the time of death and sometimes are consulted by bereaved family members regarding appropriate memorials. Recommending the Student Loan Fund as a memorial offers you an opportunity to aid a family in grief and at the same time to aid a worthwhile cause sponsored by your MSMA.

Soon you will receive samples of a memorial envelope designed for your Student Loan Fund. Look it over; send us your suggestions and criticisms. Discuss it with your local friendly undertaker for possible use by families who might be disposed to help medical education.

Finally, keeping in mind our own destiny, as well as the aphorism of St. Francis that "Death is a holy and wholesome thought," discuss it with our families so that if, God forbid, there should be a tragedy this worthy cause can be remembered.

John J. Regan, M.D.
Chairman
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Laboratory Letter

Diagnosis of Sudden Infant Death Syndrome (S.I.D.S.)

RALPH A. FRANCIOSI, M.D.*

The clinical diagnosis of Sudden Infant Death Syndrome (S.I.D.S.) must be confirmed by autopsy since sudden unexpected death in infancy in 15% of cases[1] is due to infection (viral pneumonia, meningococcemia, viral myocarditis, meningitis), trauma, or congenital malformations, often cardiovascular. The autopsy must be done as part of the death investigation and supplemented by knowledge concerning the circumstances of death.

Prior to the autopsy examination, all suspected S.I.D.S. cases should be ex-rayed to rule out bone trauma. A careful external examination will note any evidence of trauma. The autopsy in S.I.D.S. cases shows nonspecific morphologic alterations that are not significant enough to cause death. The gross examination shows pulmonary edema and petechiae on the pleura, epicardium and thymus. The microscopic examination shows focal inflammatory infiltrates in the upper airway, primarily the larynx. Prominent lymphoid tissue (mesenteric lymph nodes, Peyer's patches, malpighian corpuscles in spleen and thymus) is commonly observed.

The autopsy examination should include gross inspection and microscopic evaluation of all organs, including the brain and spinal cord. Bacterial cultures should be taken from blood, lung and spinal fluid. Ideally, viral studies and toxicology specimens should be obtained. A sample of serum should be frozen for future reference.

Subtle lesions such as myocarditis, pneumonia and meningitis can be detected quickly by processing heart, lung and brain tissue with the next day's surgicals. Bacterial cultures can be reviewed 24-48 hours after autopsy and correlated with anatomic findings.

Naeye,[2] in a series of S.I.D.S. cases, demonstrated anatomic lesions that indicate chronic hypoxemia. The observations included: medial hypertrophy in pulmonary arteries, persistence of fetal fat and foci of extramedullary hematopoiesis in liver. These lesions are the result of chronic hypoxemia. A disorder of the autonomic nervous system, may cause S.I.D.S. This theory is supported by a recent study showing changes in the carotid bodies.[3]

The pathologist is essential in identifying S.I.D.S. cases and either he or the family physician has an important role in communicating the findings to the family. This may avert permanent psychological trauma since the absence of abuse, neglect and preventable causes of death are findings which relieve the family of feelings of guilt and uncertainty.

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*Project Director of Minnesota Sudden Infant Death Syndrome Program, and Director of Laboratories at Children's Health Center, Minneapolis.

References

1. Beckwith JB: The sudden infant death syndrome. DHEW Publication No. (HAS) 75-5137, 1975.
2. Naeye RL: Hypoxemia and the sudden infant death syndrome. Science 186:837, 1974.
3. Naeye RL: More evidence S.I.D.S. is neurologic. Med. World News, May 3, p. 49, 1976.

Continuing Medical Education

Grand Rounds program takes place every Tuesday noon, 12:00-1:00; Mental Health Grand Rounds takes place every first and third Thursday noon, 12:00-1:00. For further information call Minneapolis Children's Health Center 874-6206, 2525 Chicago Ave. South, Minneapolis, MN 55404.

Fracture Conference

Epiphyseal Growth Plate Injuries of the Distal Tibia

HAMLET A. PETERSON, M.D.*; ROBERT C. BREWSTER, M.D.† and
KENNETH A. JOHNSON, M.D.*

Dr. Hamlet A. Peterson:

Approximately 15% of all fractures seen in children involve epiphyses and the second most common epiphyseal injury involves the distal tibia.[1] This fracture conference is concerned with distal tibial epiphyseal injuries of type IV in Salter and Harris' classification.[2] This injury is a longitudinal intra-articular shear fracture involving the metaphysis, physis (epiphyseal growth plate), and epiphysis (Figure 1). In order to allow resumption of normal longitudinal growth after the fracture has healed, the displaced fragments must be anatomically reduced.

Case 1

Dr. Robert C. Brewster:

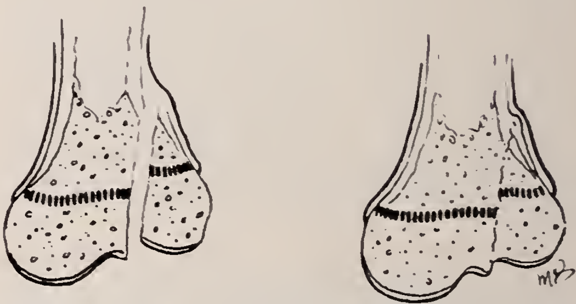

Fig. 1—Schematic drawing of longitudinal fracture through metaphysis, physis, and epiphysis of a growing long bone. If the fracture is allowed to heal in a displaced position, bone union from metaphysis to epiphysis will cause irregular and incomplete growth of physis.

This girl was nine years eight months old when she was thrown from a horse, injuring her left ankle. She had a moderate amount of swelling of the ankle, but the neurovascular status was intact.

Dr. Stephen E. Barron†:

The roentgenogram (Figure 2 A) shows that there is a fracture of the medial malleolus involving the epiphysis, but I'm not sure if the metaphysis has been sheared.

Dr. Peterson:

When the fragment is seen tilted, as in this roentgenogram, the physis and metaphysis may not be distinctly visible. Oblique views, however,

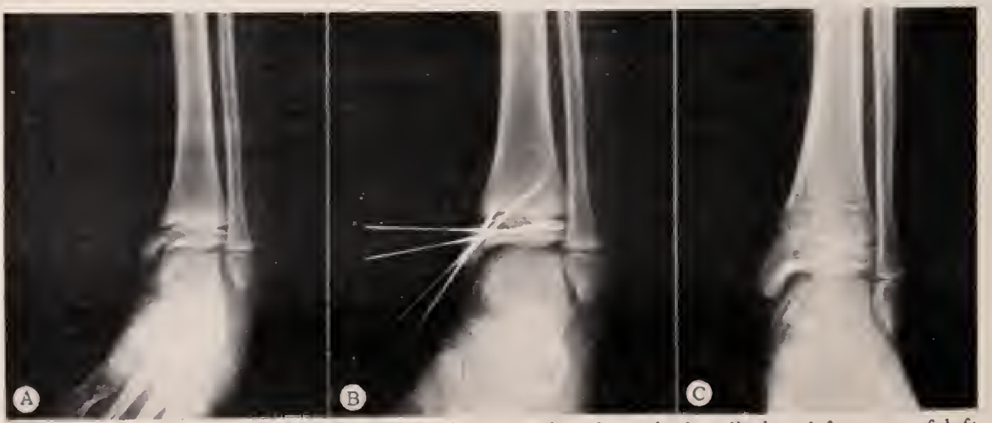

Fig. 2 (Case 1)—(A) A girl nine years, eight months of age had a displaced fracture of left medial malleolus that extended across epiphysis, physis, and metaphysis. (B) Intraoperative roentgenogram after open reduction and fixation with four Kirschner wires. (C) At the age of 11 years four months (20 months after fracture and surgery), transverse growth arrest line is parallel to both the physis and the ankle joint mortice, indicating that longitudinal enchondral growth is even.

Fracture Conference, July 23, 1975.

*Consultant, Department of Orthopedics, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

†Resident in Orthopedics, Mayo Graduate School of Medicine (University of Minnesota), Rochester, Minnesota.

confirmed that a small metaphyseal fragment had been displaced with the medial malleolus. What treatment is indicated?

Dr. Barron:

First, I would try closed reduction, but I believe that this injury is probably best treated open and fixed internally with K-wires to hold it reduced.

Dr. Peterson:

This fracture demands accurate reduction and maintenance of the reduction. Whether reduction is closed or open depends primarily on the initial displacement and on the stability once the fracture has been reduced. Even if closed reduction is successful, the fragment could redisplace during the cast period if no internal fixation is used. Frequent roentgenograms would be required during the first two weeks if treatment is closed.

Dr. Brewster:

It was elected to open the fracture. Initially, transverse K-wires were placed in the epiphysis to hold the fragment. Satisfactory stability was not achieved, and two additional K-wires were inserted obliquely across the physis into the metaphysis (Figure 2 B).

Dr. Peterson:

The first two transversely placed wires did not hold the fragment securely. The fragment wobbled. At surgery, a rim of metaphyseal bone was seen; this would classify the fracture as type IV. Whether or not pins should be placed across the physis depends on several factors. One factor is the age of the child. Obviously, a 15- or 16-year-old child has little growth remaining, and one would not hesitate to place pins across the physis because even if it did close, there would be no growth problem. In a young child, however, one would be more hesitant because of a growth problem, which would have more potential for an angulation or a shortening deformity. The most important factor to consider is the diameter of the wire to be placed across the physis because when the pin is extracted, the hole will fill with blood. If the hole is small, the physis will be stronger than the resulting fibrous tissue in the hole and will continue to grow. But if the hole is large, the resulting metaphyseal-epiphyseal bone bridge could tether the physis or even cause premature closure. Another factor is the time that the pin is left in place, particularly if a screw has been used. The longer the pin is in place, the greater the chance of premature closure.

Dr. Brewster:

Postoperatively, the ankle was placed in a Robert Jones compression dressing and eventually a cast. The Kirschner wires were removed one month after the injury. The final cast was removed two months after injury.

Dr. Peterson:

What instructions should be given to the parents?

Dr. Barron:

The parents should be told that the child could start walking right away; of course, she should start walking slowly at first. The child can become more active but should return at intervals so that the growth can be checked to determine if there is premature physeal closure.

Dr. Brewster:

The patient was reexamined on several occasions. When the last roentgenogram was taken, 20 months after the operation (Figure 2 C), the girl was 11 years four months old. She had no pain, and her foot and ankle were normal.

Dr. Peterson:

Note particularly the white growth arrest line in the metaphysis of the tibia. Whenever there is an injury or a generalized illness, the physis temporarily stops growing. However, the minerals continue to be deposited, leaving a more dense line of bone. When the physis resumes growth, it gradually grows away from this "marker." The resulting "white line" is seen in all long bones, not just the injured bone, and it gradually fades with time as bone remodeling occurs.[3-4] Thus, a roentgenogram of the normal uninjured tibia would quickly determine the relative growth of both the injured and uninjured physis. This patient had equal growth of both distal tibiae.

Dr. James H. Dobyns*:

What are the implications of the condensation line on the normal side? Is that supposed to be the same injury or are there two injuries, one to each foot?

Dr. Peterson:

The white lines are the result of the same injury. Actually, they also were noted in both proximal tibiae and both distal femora, as well as in the long bones of the upper extremities.

Dr. Dobyns:

Does this always occur with injury in which the physis stops growing temporarily?

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*Consultant, Department of Orthopedics, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

Dr. Peterson:

Yes. The intensity of the markers will be relative to the degree of injury and duration of the temporary growth arrest.

Case 2

Dr. Brewster:

This boy was seven years 11 months old when he jumped from a roof and injured his right ankle. He was treated with casts for one month and was first seen at the Mayo Clinic five weeks after injury (Figure 3 A).

Dr. Steven F. Hoff†:

There is a fracture of the medial distal tibia crossing the physis as well as a minimal slip of the fibular physis.

Dr. Peterson:

The injury is five weeks old and the amount of healing is difficult to determine by the roentgenogram. There is not much union visible between the malleolus and the epiphysis or between the metaphyseal fragment and the metaphysis. This degree of proximal displacement of the tibial fracture, if left untreated, would result in a union across the physis between the tibial metaphysis and the medial malleolus epiphyseal fragment. Additional growth laterally would result in ankle varus. But what can be done five weeks after injury?

Dr. Hoff:

The problem is difficult, but perhaps the growth of the whole tibial plate should be arrested.

Dr. Peterson:

If this were done, what else would be required? The child is eight years old and should continue to grow.

Dr. Hoff:

Arrest of the growth on the other side would be necessary.

Dr. Peterson:

I agree. Epiphysiodesis could be done—of the

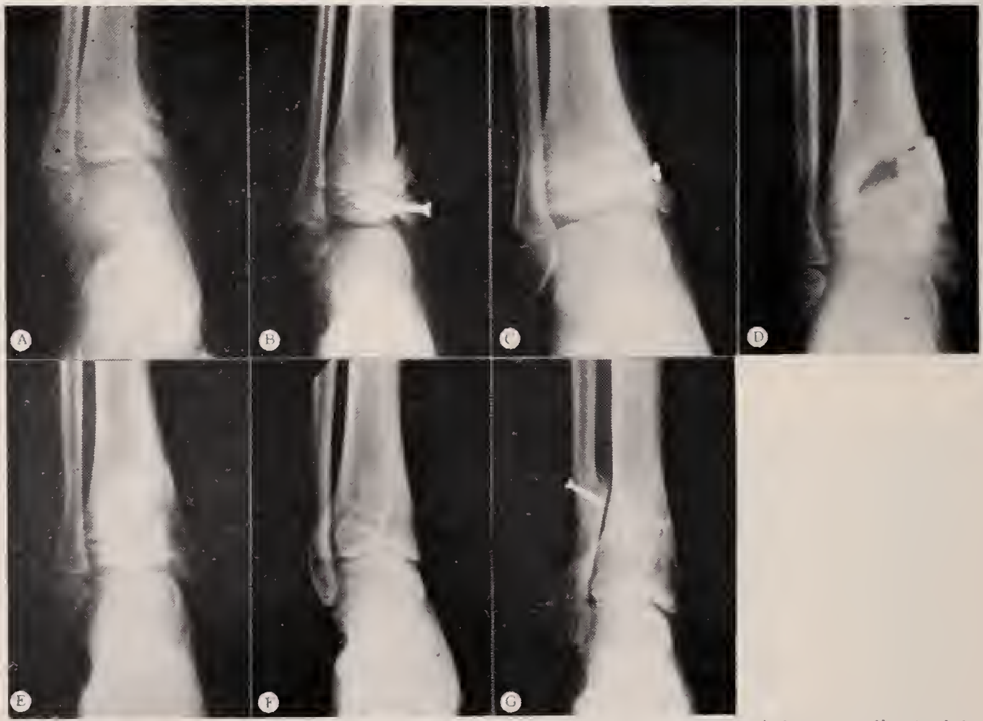

Fig. 3 (Case 2)—An eight-year-old boy five weeks after epiphyseal injury to distal right tibia (type IV) and fracture-separation of distal fibular epiphysis (type I). (B) Intraoperative roentgenogram after osteotomy of the healing malunion, reduction, and fixation with a single screw. (C) Two years after operation. Note physeal closure at site of fracture and osteotomy, as well as triangular new bone formation between growth arrest line and physis on the lateral side of distal tibia. (D) At the age of 10 years one month. Open wedge osteotomy. Note joint mortice restored to position perpendicular to tibia. (E) At the age of 10½ years. Osteotomy healed. Normal lateral portion of tibial physis is well visualized. (F) At the age of 21 years three months. Recurrence varus angulation of distal tibia as expected. All physes closed; growth complete. Right tibia three cm shorter than left on scanogram. (G) At the age of 25 years five months. Four years two months after second open wedge osteotomy (fourth operation).

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†Resident in Orthopedics, Mayo Graduate School of Medicine (University of Minnesota), Rochester, Minnesota.

contralateral distal tibia and fibula to equalize the leg lengths and of the ipsilateral distal fibula to prevent fibular overgrowth. What other choices are there?

Dr. Hoff:

An accurate reduction can be attempted.

Dr. Peterson:

Accurate reduction requires osteotomy through the fracture line and internal fixation, which may result in partial physeal closure. This could be successful, but if it isn't, the ultimate result will be the same as if there had been no treatment.

Dr. Brewster:

It was elected to open the fracture. The fragment was osteotomized, and an attempt was made to realign it. A screw was used to hold it in place (Figure 3 B).

Dr. Peterson:

Two years after the operation, the medial malleolus was united to the major position of the epiphysis (Figure 3 C). What else has happened?

Dr. Hoff:

The varus deformity has returned.

Dr. Peterson:

The ankle mortice is no longer at 90° to the longitudinal axis of the tibia. The medial physis has ossified. The lateral tibial physis, as well as the fibular physis, is open and growing. The patient is now 10 years one month old. If there is no more treatment, what will most likely occur?

Dr. Hoff:

Progressive ankle varus and eventual degenerative joint changes probably will occur.

Dr. Peterson:

One alternative would be to arrest the distal fibular physis and the lateral side of the tibial physis. There is a 15° varus. Do you think this would lead to degenerative arthritis if it was left that way?

Dr. Hoff: Probably.

Dr. Peterson:

In addition, a progressive discrepancy in leg length would occur, and this may require epiphysiodesis of the uninjured leg. What is another alternative?

Dr. Hoff: An osteotomy.

Dr. Peterson: Open wedge or closed wedge and where?

Dr. Hoff: I suppose you'd have to use an open wedge.

Dr. Peterson:

Open wedge on the medial side of the metaphysis? Should the physis be left untreated and the deformity be allowed to recur? Should the osteotomy be repeated?

Dr. Hoff: I suppose the only way is to repeat the osteotomy.

Dr. Brewster:

That is what was done. The opening wedge osteotomy was performed through the metaphysis; the opening was maintained by bone graft from the proximal tibia. The screw was removed.

Dr. Peterson:

Six weeks after osteotomy (Figure 3 D), realignment is good. The physis appears to be closed medially although it is still open laterally.

Dr. Brewster:

This was confirmed roentgenographically five months later (Figure 3 E). Eleven years one month after osteotomy, a roentgenogram showed evidence of interim fibular surgery done elsewhere consisting of excision of the overgrown distal fibula and repair of the fibular ligaments (Figure 3 F).

Dr. Peterson:

The fibula is overgrown. All physes are closed, and all growth has ceased. The patient is now 21 years five months old. He has mild ankle varus but no pain or other symptoms. Another open wedge osteotomy was performed to align the joint. It was also necessary to osteotomize the fibula. Four years later, the sites of both osteotomies had healed. The ankle was straight and asymptomatic (Figure 3 G). The patient, however, was having low-back pain, which was attributed to a one-inch shortening (clinical measurement) of the right leg. Thus, the overall result was less than optimal. This patient was followed 17 years. The literature suggests that repeated osteotomies to reduce deformity are the standard treatment for this situation. The second corrective osteotomy (fourth operation) might have been done earlier in this case, perhaps when the patient was 15 or 18 years old, even though he was asymptomatic at that time. One could have predicted that he was going to have symptoms that could have been prevented by proper joint alignment.

Dr. Richard M. Gross[†]: Does the patient's age influence the decision of whether an opening or a closing wedge osteotomy should be done?

Dr. Peterson:

Indirectly. A closing wedge osteotomy on the lateral side of the distal tibia is technically more difficult because the fibula must be shortened. This also shortens the tibia, whereas an opening wedge osteotomy medially gains some length. Discrepancy in leg length is always a problem, and periodic scanograms are desirable.

Dr. Jan P. DeRoos[†]: Doesn't nearly half the growth of the leg occur in the ankle?

Dr. Peterson:

The proximal end of the femur contributes 30% of the growth of the femur, and the distal end contributes 70%. On the tibia, the proximal end contributes 60%, and the distal end contributes 40%. Thus, most of the growth occurs at the knee. When the entire lower extremity is considered, the contributions are different: 12% for the proximal femur, 40% for the distal femur, 27% for the proximal tibia, and 21% for the distal tibia. Any discussion of leg length discrepancy should include the whole leg as well as its parts. For practical purposes, the distal tibial physis contributes approximately 20% of the growth of the lower extremity.

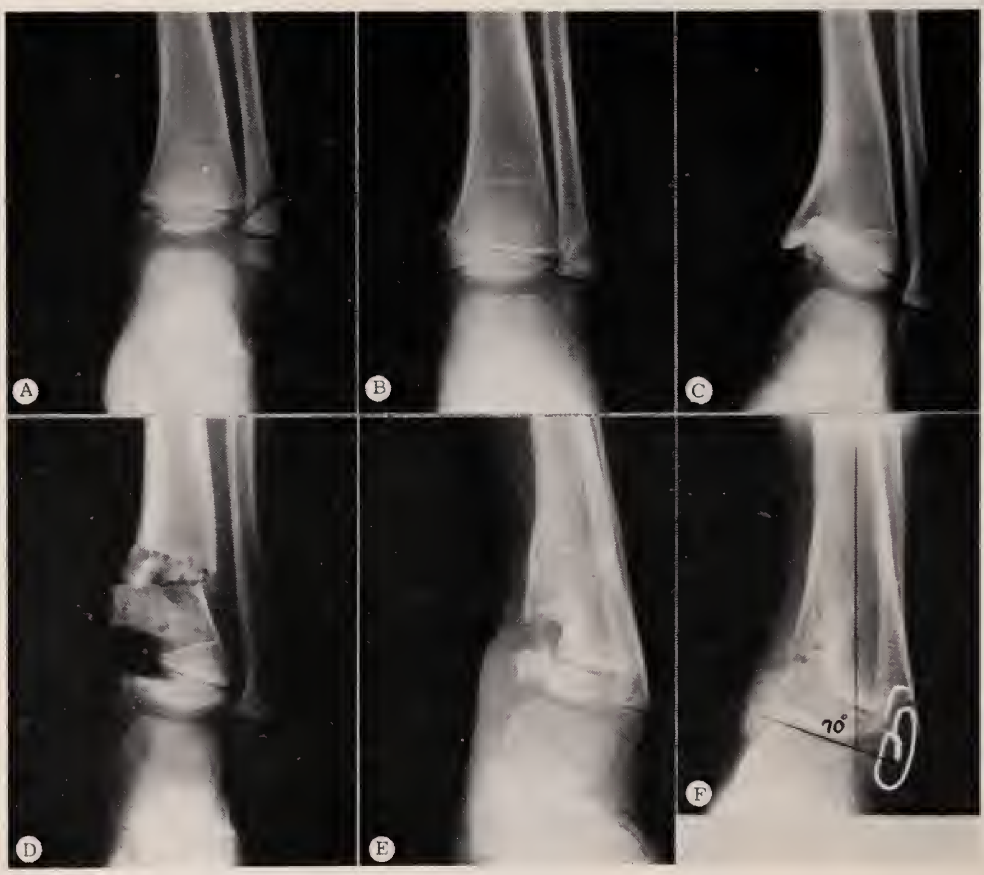

Fig. 4 (Case 3)—(A) At the age of three years eight months. Type IV injury distal left tibial epiphysis and transverse fracture through distal fibular metaphysis. (B) Seven weeks after fracture. At time of cast removal. (C) At the age of five years four months. Twenty months after injury. (D) At the age of five years four months. Intraoperative roentgenogram at time of corrective osteotomy combined with excision of the bone bridge and insertion of interposition material (sheet Silastic and Gelfoam) on July 11, 1968. (E) At the age of six years two months. Note rectangular new bone between the second growth arrest line (marking the time of the osteotomy) and the physis, indicating longitudinal growth of the distal tibial physis. (F) At the age of nine years six months. Four years two months after osteotomy. Note that metaphyseal-epiphyseal nonunion is contiguous with the physis, allowing longitudinal growth in the same degree of varus. Leg lengths were equal and the patient was asymptomatic.

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[*] Resident in Orthopedics, Mayo Graduate School of Medicine (University of Minnesota) Rochester, Minnesota.

Case 3

Dr. Brewster:

On October 6, 1966, this boy was three years eight months old when he fell and injured his left ankle. When first seen, he had swelling about the ankle (Figure 4A).

Dr. Joe W. Crow†:

The shaft of the distal fibula is fractured and there is also an epiphyseal injury to the distal tibia, probably type IV.

Dr. Peterson:

Oblique roentgenograms confirmed that there was a metaphyseal fragment of bone. Although the eventual outcome can be predicted, the prognosis is worse because the child is only three years old. The treatment should be accurate reduction and maintenance of reduction, but this was not done. The leg was casted for seven weeks (Figure 4B).

Dr. Crow: The fracture is now sticky. Surgery at this time probably would not give any impovement. No more treatment was recommended.

Dr. Brewster:

One year eight months after his injury, when he was five years four months old, the child complained of progressive varus deformity, and he was referred to the Mayo Clinic (Figure 4C).

Dr. Crow: There is a relatively severe varus deformity that also involves the fibula.

Dr. Peterson: What can be said about the growth—based on the "white line"?

Dr. Crow:

There is much growth on the lateral part of the distal tibia but practically none on the medial side.

Dr. Peterson:

I agree. The time of injury is marked by the arrest of growth, as evidenced by the thin white line that is perpendicular to the long axis of the tibia. The triangular metaphyseal bone distal to this line confirms the normal growth laterally and no growth medially, where there is bone union between the metaphysis and epiphysis. The open physis laterally is tilted 45° from normal. Thus, there is varus deformity. The boy is only five years old. What are the options? They are the same as in the other cases. Closing all of the distal physes of both ankles and osteotomy would result in considerable shortening of the tibiae. The other option is to perform repeated open wedge osteotomies throughout the period of growth. Is anything else possible? If the bone bridge or medial union could be excised and prevented from reforming—that is, the creation of a nonunion, combined with a corrective osteotomy—the tibia may grow straight. Some sort of interposition material would be necessary. In 1968, this had not been considered or performed, but in this case it seemed reasonable in a child of this age with this severe a deformity.

Dr. Brewster:

At surgery on July 11, 1968 (Figure 4D), a rectangular piece of bone containing the bone bridge and exposing the open physis in the center of the bone was excised from the medial side of the distal tibia. This bone was contoured into a triangular shape and inserted as a opening wedge on the medial side into a complete osteotomy 1 inch proximal to the abnormality. The cavity was lined with sheet Siastic that was held apart with Gelfoam as an interposition material in an attempt to prevent reformation of bone and another bone bridge.

Dr. Peterson:

Note that the entire deformity was not corrected. There is still a varus angle of 20° of the physis and joint line perpendicular to the shaft of the tibia. This was the maximal correction possible because the osteotomy had to be carried out high enough to prevent metaphyseal fracture. A 25° improvement (the angle of the triangular block of bone inserted) was obtained.

Dr. Brewster: A cast was worn for two months.

Dr. Peterson:

Nine months after the operation (Figure 4E), the physis remained open and was contiguous with the nonunion medially, as desired. Most importantly, however, a straight longitudinal growth was produced, as confirmed by the rectangular piece of new bone formation immediately proximal to the physis and distal to the triangular growth of metaphysis (Figure 4C). As long as this longitudinal growth persists, treatment such as repeated osteotomies or epiphysiodesis is unnecessary. Note that the fibula was not overgrowing and that the 20° angle varus was unchanged.

Another problem is that the medial malleolus was never reduced. The medial malleolus was allowed at injury to retract proximally. And the malleolus has remained proximally because it was never put distally. Thus, it is not growing adequately because it isn't under the proper stress stimulus.

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*Resident in Orthopedics, Mayo Graduate School of Medicine (University of Minnesota) Rochester, Minnesota.

The patient lived 500 miles from our clinic, and follow-up was assumed by another facility. A temporary epiphyseal arrest of the distal fibula was undertaken because the distal fibula was considered to be overgrowing. A wire was passed around the fibular epiphysis perpendicular to it (Haas epiphyseal arrest)[5] (Figure 4F). Theoretically, when the wire is taken out, the fibular physis will start to grow again. The wire serves the same purpose as does a staple, only staples would be hard to insert into a small physis like this. Whether this operation is needed is questionable because the physis of the fibula is still higher than the ankle joint mortice. However, the ankle mortice is still in good alignment and is in no more varus than it was previously. The tibia is still growing, and the physis is still open.

Dr. Brewster: Clinical and roentgenographic varus was unchanged four years two months after osteotomy (Figure 4F).

Dr. Peterson:

The physis and nonunion remained open, and longitudinal growth persisted, as confirmed by the maintenance of 20° varus. The two growth arrest lines from the injury and from the surgery are fading. Because there has been no new injury, illness, or surgery (other than the minor wire insertion into the fibula), no new growth arrest lines are present. Orthoroentgenograms confirmed equal leg lengths.

The fibular wire could be removed as long as distal tibial growth persists. The patient should be followed until maturity. A final corrective osteotomy could be done now or as soon as growth ceases. If growth ceases early, epiphysiodesis of the opposite ankle should be performed immediately to prevent progressive discrepancy in leg length. This case demonstrates the possibility of salvaging physeal growth potential which has not been previously possible. As better interposition materials are developed, the chances of success should improve. Subsequently, we have used block Silastic and methylmethacrylate in similar cases, with varied results. The procedure is experimental and should be done only in selective cases.

References

1. Peterson CA, Peterson HA: Analysis of the incidence of injuries to the epiphyseal growth plate. J Trauma 12:275, 1972.
2. Salter RB, Harris WR: Injuries involving the epiphyseal plate. J Bone Joint Surg [Am] 45:587, 1963.
3. Harris HA: The growth of the long bones in childhood, with special reference to certain bony striations of the metaphysis and to the rôle of the vitamins. Arch Intern Med 38:785, 1926.
4. Park EA: The imprinting of nutritional disturbances on the growing bone. Pediatrics 33 Suppl:815, 1964.
5. Haas SL: Retardation of bone growth by a wire loop. J Bone Joint Surg. n.s. 27:25, 1945.

Cover Painting
"Skating on the Lagoon"

Dr. David Anderson of the Austin Medical Clinic, Austin, painted "Skating on the Lagoon" in a night class offered several years ago by the Austin Public Schools. The basic scene is done with oil paints, and the skaters with acrylic paints. (One may use acrylic on oil but not visa versa.) The lagoon is located in an Austin park near his former home. He had a professional photographer photograph the painting published here.

He paints a half day a week with a group during the winter months. His favorite subjects are scenes from his summer home on Ten Mile Lake near Hackensack, Minnesota—the maple sugar house, the sauna on the lake shore, and sailboats on the lake.

He frames his own paintings using weathered wood from deserted old barns. Dr. Thomas Seery, one of his colleagues in the Austin Clinic, has a work shop in his basement. Seery cuts and grooves the wood for the frames.

Dr. Anderson is a surgeon with the Austin Clinic. He is a graduate of the University of Pennsylvania School of Medicine and had his surgical training at the Philadelphia General Hospital.

Currently he is involved in writing a history of the Austin Clinic. Dr. Anderson was stimulated to write this history when he discovered an old document in the files of St. Olaf Hospital, Austin, dated October 3, 1902, calling for a special meeting for the purpose of organizing an official Medical Society for Mower County.

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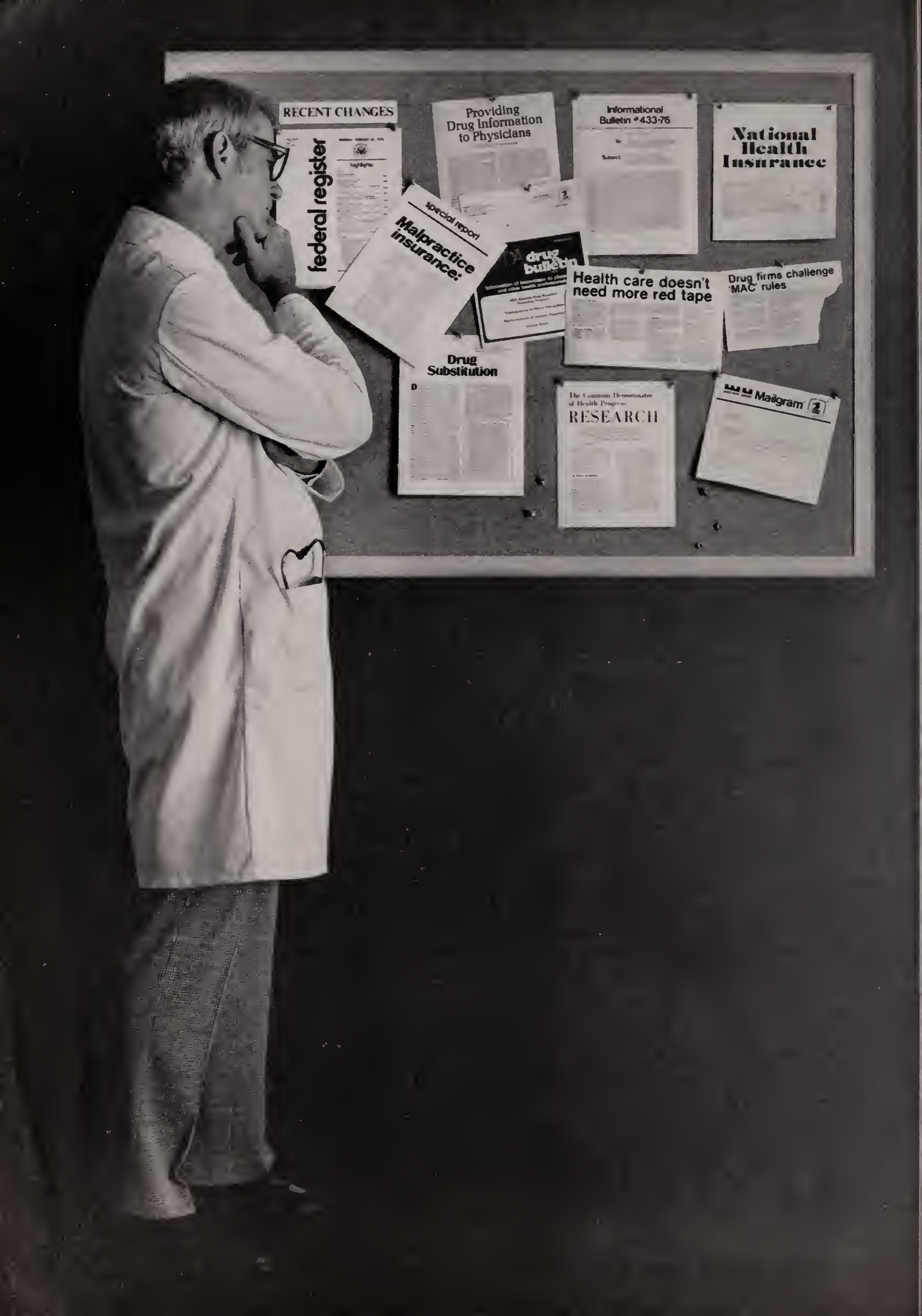
(Continued on page 66)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Reminiscences of a Superannuated Professor

OWEN H. WANGENSTEEN, M.D.*

MINNESOTA, LARGER IN territory than any State east of the Mississippi River, had a population of 780,773 in 1880, which figure had grown to 1,310,283 by the 1890 census, almost doubling in a decade. The University's Medical School came into being in 1888. None of the State's physicians then delimited his practice to a specialty. A Board of Licensure was developed in 1887, and three years later there were 1,191 licensed physicians, 156 were homeopaths; 86 were exempt from licensure regulations, having practiced in the State prior to 1887 *(Official Register Minnesota 1883-1890)*. Abraham Flexner recommended enlargement of the University's Hospital facilities in his visit of 1909, but there was no University Hospital until 1912.

President Vincent and the Medical Faculty

The composition of the University's Medical faculty of the 1910-25 period is undoubtedly known to many of you. George Edgar Vincent had come from the University of Chicago to be the University of Minnesota's third president in 1911. In the space of six short years, when he left to join the Rockefeller Institute, Vincent had made out of a group of sleeping, mediocre self-satisfied colleges, the beginnings of a great university, through the simple expedient of the power of appointment. He brought Guy Stanton Ford, Lotus Delta Coffman, Walter C. Coffey, and Elias Potter Lyon, Dean of the Medical School. The full-time plan for the preclinical medical sciences then became definitely established. Our Department of Anatomy was probably one of the strongest in the country, including Clarence M. Jackson, Richard E. Scammon, Thomas Lee, Hal Downey, A. T. Rasmussen, and Jay Myers. In earlier years, anatomy had been taught, like other premedical disciplines, by part-time practitioners. Pathology was represented by Harold E. Robertson, E. T. Bell, and Margaret Warwick. Bell was greatly admired and loved by two generations of students. Moses Barron, an instructor, who subsequently did a fellowship in medicine and entered practice, distinguished himself by pointing out that pancreatic calculi caused atrophy of the acinar, tryptic, secreting cells of the pancreas. He indicated that several observers also had demonstrated a similar occurrence attending ligature of the pancreatic ducts in dogs at the turn of the century. The Ontario orthopedic surgeon, Frederick Banting, noted Barron's suggestion and put the thesis to good use in the production of insulin.[†]

In 1913, Arthur D. Hirschfelder came from The Hopkins Department of Medicine to head Pharmacology. Leonard Rowntree was called in 1916 from the Department of Pharmacology at The Hopkins to become our Professor of Medicine. Wilford P. Larson, after prolonged postgraduate training abroad, organized a division of bacteriology under the auspices of the Department of Pathology. It was recognized as an independent department in 1919.

In my medical student days (1918-21), save for the brief interval in which Rowntree headed the Department of Medicine, our clinical teachers were all part-time community clinicians earning their livelihood in practice, spending a few hours a week at the University. S. Marx White was Chief of Medicine, flanked by Charles L. Greene, J. P. Schneider, Frederick Schaaf, and a number of other competent physicians. Later J. Charnley McKinley, keen neurologist, was acting director for several years. George Fahr, a brilliant teacher, to whom this surgeon owes a good deal, joined the staff in 1921. Under the direction of Cecil J. Watson in the late 1930s the Department of Medicine took a strong forward leap.

Dr. James E. Moore was the real founder of the Department of Surgery and a leader in devel-

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[*] Regents' Professor, University of Minnesota, Department of Surgery, Minneapolis, Minnesota.

[†] Surg Gyn & Ob 31:437, 1920.

opment of the Graduate School. He was succeeded by Arthur Strachauer, my preceptor and predecessor, part-time clinical professor of the Department of Surgery, complemented by a large number of fine community surgeons, including Arthur Law, Harry Ritchie, Archibald MacLaren, Alexander Colvin, James Johnson, George Dunn, and Roscoe Webb. Dermatology under Sam Sweitzer and radiology headed by Frank Bissell were divisions of the Department of Surgery. These later became independent departments, dermatology first as a division of medicine and radiology as a division of hospital administration.

Dr. J. C. Litzenberg was Chairman of the Department of Obstetrics and Gynecology, Frederick Adair, John Rothrock, and R. T. Lavake were his associates. Horace Newhart represented Otology; these names are familiar to most of you, I am certain. J. P. Sedgwick, Professor of Pediatrics, well trained in biochemistry, was an advocate of breast feeding of infants. Pediatrics became one of the strong clinical departments at Minnesota when Irvine McQuarrie undertook to direct its destiny in 1930. William Murray, Professor of Ophthalmology, lost an arm owing to a prick of a finger while performing a mastoídectomy in December 1926. Despite amputation to delimit spread of the infection, general sepsis supervened and death followed a few days later. In the early 1930s, Lucretia Wilder, a graduate student in anatomy suffered the same fate attending a rabbit scratch of her forearm onto which a few drops of a streptococcal culture had been spilled. Prior to sulfanilamide and antibiotics, cellulitic streptococcal infections of the extremities were almost uniformly fatal.

Some of you may know how it happened I became a physician. A raw youth with hands heavily calloused from hard work entered the University of Minnesota sixty one years ago with the sole intent of becoming a farmer. I was that immature youth. Should our paths cross now, I would like to believe I would recognize him. Our lives are molded often by conditions and situations beyond our control. In the spring of 1912, my father had 50 black Poland China sows that could not farrow their young. When our pessimistic veterinarian suggested they be shipped for slaughter to South St. Paul, I begged my father to let me have a try. Multiple births are a time-consuming event, but after four weeks out of high school, I had 300 living piglets to show for the effort, and 50 living sows, all delivered by hand.

From that moment on my father was determined I should be a physician. After three years in college and the hauling of much manure in the hot summer of 1917, pitched by hand and drawn by horses, I capitulated to his wish. And so it happened that through the portals of pigs and manure, and a good spread of each, I entered medicine, though with considerable trepidation and some misgivings. In many periods of our lives, we experience transition from rejection to acceptance, in which the chastening influence of Time is the most important catalyst.

Of the 73 students in my entering medical class of 1918, only seven were women. I am informed that today 22 percent are women. This long neglected source of professional productive strength in the United States obviously is in need of correction. The recognition must be complete and without prejudice. When Alice Hamilton, noted for her great work in Industrial Medicine, became the first woman member of the Harvard medical faculty in 1919, President Lowell cautioned that the appointment did not admit her to the privileges of the Harvard Club, that she could not march in academic processions, and that she was not entitled to a quota of Harvard football tickets.* Ridiculous strictures, but our own contemporary community practices on this score would fare no better even on superficial scrutiny.

The entire problem of medical manpower is currently undergoing self-assessment. A committee of surgeons representing the American Surgical Association and the American College of Surgeons has concluded we are training too many surgeons and surgical specialists.† Basic factors determining actual needs are still somewhat unclear. Such appraisals obviously will turn up interesting and helpful guidelines for medical educators.

Epitome of Significant 19th Century Contributions to Medicine

Medicine and surgery remained quite stationary and unprogressive until the birth of microbiology as a biologic science in the last quarter of the nineteenth century. Robert Koch, physician in a small

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*J. A. Curran, Harvard School of Public Health, 1970, p. 18.
†Surgery in the United States, 1975.

Prussian town, worked out the life cycle of the anthrax bacillus including the phenomenon of sporulation in 1876, sketching it in a three-day impressive demonstration in Ferdinand Cohn's laboratory before the Breslau Medical Faculty.

Two years later (1878) Koch established the pathogenicity of pyogenic bacteria, and microbiology became a reality. When the German surgeon Volkmann of Halle (1874) and Nussbaum of Munich confirmed the utility of Listerian practices in thwarting hospital gangrene, elective noncavitary surgery was born. In 1876-77, Alfred Hegar of Freiburg, employing in every detail the prophylactic antiseptic practices of Semmelweis (1847), reported 15 successive ovariotomies without a death, marking the beginnings of elective abdominal surgery.

Ten years later, Lawson Tait (1886) of Birmingham, England, reported 139 successive ovariotomies without mortality. He affected disbelief in the germ theory of disease and discredited Lister, but was known to invoke high standards of surgical cleanliness. Despite Lister's visit to America at our first Centennial (1876), most American surgeons, following the example of Samuel Gross of Philadelphia, rejected Listerian practices.

William Henry Welch spent considerable time with Julius Cohnheim in Breslau in 1877-78 and made a brief visit to Cohnheim and Koch in 1884. Welch introduced the teaching of microbiology in America when he went to The Hopkins as Dean of the Faculty in 1884. Elective surgery in America lagged several years behind that of Germany because of our tardiness in accepting the practices of Semmelweis and of Lister, and microbiology too, which has proved medicine's greatest benefactor.

If one were to epitomize the most significant contributions to medicine's advance in the nineteenth century, all would agree, I believe, that microbiology, embracing successively the work of Semmelweis, Pasteur, Lister, and Koch is the foremost. Anesthesia, the innovation of two American dentists, Horace Wells (nitrous oxide, 1844) and William T. G. Morton (ether, 1846) had long been awaited, and was heralded and quickly adopted world-wide as a welcome device for avoidance of pain in operative procedures. Welch (1913) credited Billings' creation of the Surgeon General's Catalogue of medical literature (1880) as an event of even greater significance than anesthesia. Deserving of being ranked with these great discoveries of the nineteenth century are the Xrays by the physicist Konrad Roentgen of Würzburg (1895), since known as Roentgen rays.

The Harvard and The Hopkins Struggle to Improve American Medical Education

Harvard's great President, C. W. Eliot, in 1869, the very year that William W. Folwell came to Minnesota as our first President, made a strong effort to improve Harvard's medical school curriculum. He wished to lengthen the course of training from two to three years, outlining conditions for admission of students to medical school. It was not uncommon practice for all students to audit the same medical lectures, even though the second-year students had heard them the year before. Strangely enough, Oliver Wendell Holmes, greatly loved and admired member of the faculty since 1847, together with Henry J. Bigelow, opposed Eliot's suggested curricular changes. They said, in effect, Harvard is today the finest medical school in the land. Why change? The eloquence of Eliot and his quiet determination finally persuaded Holmes to desist in his objection to Eliot's pleas. The primary reason that Eliot's changes did not loom significantly on the medical horizon at the time was that they were essentially only modest improvements without radical departure from the poor tutorial practices of that day.

Daniel Coit Gilman, The Hopkins' first President, in 1876 established new precedents for universities in our country. The late Richard Shryock (1953), writing of the unique influence of The Johns Hopkins University upon American Medicine, said "although still a young institution, The Johns Hopkins is the oldest University in the United States." What Shryock implied is that other American universities of that day actually were not universities in the true sense* They were more interested in the dissemination of knowledge than in its advance, one of the real responsibilities and challenges of great universities. Leaders in University disciplines obviously should be more concerned over *first words* than *last* relating to discovery.

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*Acta Historica Scientiarum 10:7-27, 1953.

Gilman selected John Shaw Billings as his primary advisor. William Henry Welch was chosen as Leader of the Medical Faculty and its first Dean. Gilman, Billings, and Welch sought for their medical school the finest talent available anywhere. The Hospital actually did not admit patients until 1889 and registrants for the first medical class were accepted in 1894. The important role of The Hopkins in elevating medical education in this country in the final decade of the nineteenth century can not be overestimated. Its emphasis upon research requiring full-time appointments in all the clinical disciplines has had a continuing beneficial influence upon American medicine, not widely emulated in our medical schools until after World War II.

Significant Minnesota Contributions

What is Minnesota's most important offering to Medicine's advance? On this issue, there can be no universal agreement. Certainly the University of Minnesota and the oldest of its three medical schools deserve high marks. All the preclinical disciplines of the Medical School have been strong since the early days of Dean Lyon. Strengthening of the clinical disciplines came gradually with full-time appointments.

From the vantage point of the elapse of more than six decades, it is probably correct to say that one of the State's most significant contributions was development of the Mayo Clinic and Foundation at Rochester that came into being at the turn of the century, evolving in the 1915-17 period, a graduate training program in affiliation with the University of Minnesota. The Mayo Clinic is one of the great medical centers of the world. The first complete physical examination of patients emerged there, a practice that had been overlooked by many professors of medicine.

Affiliation was vigorously opposed by many of the University's clinical faculty, several of whom resigned in protest. Their opposition was not against the Clinic itself but against affiliation at the graduate level. However, in 1917 the arrangement was confirmed by Minnesota's Legislature. William Mayo apparently had made the proposal to President Vincent, a suggestion that found ready acceptance among the highest echelons of administrative officers of the University and several important members of the clinical faculty too; Guy Stanton Ford, Dean of the Graduate School, Elias Potter Lyon, Dean of the Medical School, and James Moore, Professor of Surgery, lent the Mayo-Vincent proposal the much needed support for viability.

As late as 1926, at a meeting of the local Gridiron Club, Soren P. Rees of the Minneapolis General Hospital staff expressed his disapproval in vehement language. When he had finished, William Mayo sitting a few places away, remarked "Soren, I have never heard you say it better," a sortie that tells much of the genius of Will Mayo. On a trip abroad in 1927-28, armed with letters of introduction volunteered by Dr. William Mayo, I found that the name Mayo was a household word and an open sesame to acceptance by professors of surgery everywhere. Opposition to the Mayo Clinic over the years has virtually disappeared. Today, the Mayo Foundation also supports a medical school, the third in the State, with a large staff embracing all disciplines of medicine, many of whose representatives have a primary interest in research. Undoubtedly a medical school of high quality will emerge therefrom and the Foundation's newly assumed responsibilities will reflect a sharper focus upon academic medicine. The conservative attitude of the Mayo Clinic toward new therapeutic ventures has placed it in a unique position with reference to acceptance of innovative procedures. When the Clinic is ready to endorse a new therapeutic procedure, the profession is inclined to accept its verdict as tantamount to a controlled study.

Development of the University's Clinical Facilities

From its very beginning, Minnesota's Medical School was dependent upon the willing cooperation of several voluntary and two Twin City municipal hospitals, the Minneapolis General and St. Paul Ancker, an extremely helpful arrangement. In the 1922-28 era, President Coffman and Dean Lyon struggled valiantly to complete an arrangement with the General Education Board of the Rockefeller Foundation for a gift of $2,000,000 to be matched by local monies to locate the Minneapolis General near the Medical School. The City Council vacillated in its view toward the move and the project failed. When this surgeon learned in November 1947 of the plans of the Jewish Community to erect Mt. Sinai Hospital, he urged Jay Phillips, their leader to consider placing it on or near the campus. The Jewish leaders consented. The Regents were reluctant to regard the proposal favorably.

In a study of the minutes of the Regents' meetings from their inception, I uncovered several precedents for such a procedure. In 1913, Will Mayo persuaded the other Regents to join in inviting the American College of Surgeons to place their offices and headquarters on the campus of the University. An official invitation was extended by the University but nothing came thereof. The Regents in the mid 1920s had agreed to placement of the Minneapolis General Hospital on University-owned property on or near the campus, a proposal that also failed. These antecedents offered a good precedent for bringing the Mt. Sinai Hospital to or near the campus. F. B. Snyder, Chairman of the Board, and President J. L. Morrill kindly permitted me to plead the case before the Regents in 1948. The proposal failed. Snyder and Morrill each told this surgeon that no strong pleas for enlargement of clinical facilities had previously been presented to the Regents. When the proposal of a Mayo Memorial Hospital on the campus came, the Regents were ready.

A voluntary hospital, in a metropolitan university medical setting, aspiring to leave an imprint on the medical scene, should strive to establish practical and effective working relationships with its university and medical school. The hospital thus becomes an important and durable part of the teaching program, enhancing its role in the community with assurances of acquiring national prominence as a teaching institution.

In such arrangements, the University has no interest other than to improve standards. Let me illustrate: At the end of World War II, Dean Diehl was provided a grant of $250,000 from the Kellogg Foundation in Battle Creek, Michigan, to provide returning physicians an opportunity to freshen up on advances since their entry into military service a few years before. The University Hospital in 1945 was small and overcrowded. The Hennepin County General already was fully committed to teaching arrangements. In an effort to locate this activity at the Ancker Hospital in St. Paul, Dean Diehl invited Cecil Watson and me to a session with representatives of the Ancker group, constituted by Dr. Thomas Broadie, Hospital Director, Alexander Colvin, Surgeon-in-Chief, John Noble, Hospital Pathologist, and Alfred Hoff, Clinical Professor of Medicine. Their answer was very definitely "no." However, a week later they invited us to dinner at the Town and Country Club. Colvin, spokesman for the group, said to Dean Diehl and his committee, "For patriotic reasons only we shall agree to go along with the objective; however, when the five-year period is over and the $50,000 annual gift has been expend, we want you to get the hell out of Ancker." Colvin was not given to profanity, but he and his associates intended no misunderstanding. Dean Diehl agreed. Five years came and went and Dean Diehl was about to recall his full-time representatives to the University. Said Broadie to the Dean, "We have learned there is nothing to fear from the University; we want you to stay." Said the Dean, "What about the $50,000 annual support item?" Replied Broadie, "Somehow or another we shall find it." The primary influence of full-time University personnel is to upgrade and strengthen the voluntary hospital's program, not only in the care of patients, but improvement of its education ventures too.

My plea with the Regents in 1948 was that whereas ownership and control of its hospital by the University is desirable, it is by no means mandatory; Harvard and Columbia Universities have no University Hospital, but yet are able to occupy and guide the destinies of hospitals occupied by their staffs. There is a definite gain to community medical education when voluntary and municipal hospitals have an effective working relationship with the University. Such an arrangement obviously mandates participating hospitals to support several full-time men in the basic clinical disciplines as well as a research laboratory.

When Lister went to Glasgow as its professor of surgery in 1860, he appealed to the Chairman of the Board of Management of the Glasgow's Infirmary, for a hospital appointment, saying that his role as teacher would be improved thereby. Said Mr. David Smith, the Board's Chairman, "Mr. Lister, that is an Edinburgh idea. Our Hospital concerns itself solely with healing, not with education,"* a stultifying idea long since fortunately abandoned.

The University Professor's Role

Early in my privileged years as Chairman of the University's Department of Surgery, I came to appreciate that my chief responsibility was to try to create an atmosphere friendly to learning. Only where teachers succeed in kindling fires of enthusiasm for learning is the educative process well served. Other important functions of the departmental chairman are those of sideline cheer leader and water boy. Dr. E. P. Lyon, great Dean of our School from 1913 to 1936, cited Gunga Din, Kipling's regimental water carrier, as the greatest of all Deans. If a School is to thrive and contribute to the patrimony and advancement of its disciplines, its leaders must not accord research second place in their thoughts.

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*H. C. Cameron, Reminiscences of Lister, Glasgow, 1927, p. 9.

Support of Research in Early Years

Will Mayo, sensing the need of the Medical Faculty for research monies persuaded the State Legislature to provide $50,000 annually for medical research. Though divided between more than 50 individuals, it was like manna from Heaven.

When I began in the mid 1930s to attract a few private patients, I decided it unwise to present an affluent patient with a fee for service. It was a device that paid off handsomely for my Department and the Medical School. Let me tell you of one instance. I had operated upon a large woman who had cancer of the upper third of the rectum and had been advised by the best talent in the State to accept a colostomy. Her dear husband, whom I came to know well, loved every milligram of her large frame. It proved feasible to preserve sphincteric function and to restore intestinal continuity. Ten years went by. Then, unannounced, the grateful husband came to my office with a friend. After 20 minutes of conversation, said the friend, "Tell me why are we here?" Said my friend: "We are here to talk about your problem." Retorted the visitor: "I have no problem." "Yes, you have," said my friend. "Well, what is it?" queried the visitor. "It is your money, your money is your problem," said the grateful husband. The upshot was he telephoned me later in the day to say that our surprised visitor was contributing $100,000 for research. In fact, before he died, the visitor, convinced of the importance of research, had contributed more than $400,000 to the Department of Surgery to support an aggressive research program. Meanwhile, another grateful patient contributed $500,000 to endow a Professorship in the History of Medicine; unfortunately its office carried no budgetary support. The grateful husband quickly raised $200,000 to provide an endowment for collateral support of the office. The advice of the preacher in Ecclesiastes is no fable. "Cast thy bread upon the waters;" it is, indeed, an action followed almost invariably with usurious returns.

Great Twentieth Century Influences upon American Medicine

Among great developments of this century in medicine, the contribution of Flexner (1910) in upgrading undergraduate medical education and elimination of inferior medical schools ranks high. He examined our school in May 1909 and remarked that the laboratories of the preclinical disciplines were excellent; that the clinical facilities were meagre and needed enlargement. The Hopkins innovation at Baltimore actually preceded the Flexner report by two decades, a plan of medical school staff construction that Welch imported from Germany in 1884.

Enlistment of the expanding V.A. Hospital system into the undergraduate and graduate training programs of medical schools under the supervision of Deans' Committees after World War II was a remarkable innovation that greatly strengthened the tutorial posture of our medical schools. It was the brain child of Paul Magnuson, a former Minnesotan, whose professional life as a surgeon of trauma was spent in Chicago. This achievement rivals in importance Flexner's contribution to renovation of American medical education.

When the National Institutes of Health granting agency was established after World War II, there came a tremendous upsurge in support of medical research that brought great lustre to American medicine, elevating it to a position of leadership in the world.

These three achievements lent American medicine the stimulus it needed to match the brilliant scientific accomplishments of pre-World War II German medicine.

Insulin, Vitamin B_{12} and cortisone are miracles of our age, as are also sulfanilamide, penicillin, streptomycin, and other antibiotics. For the first time, surgeons had at their disposal, effective means of controlling cellulitic infections.

Surgeon's Role Influenced by Medical Gains

Surgeons' activities over the past several decades have been changed drastically by developments in other fields. When this surgeon spent several weeks at the Gillette Hospital for Crippled Children in St. Paul in the 1921 era, tuberculosis of bone and joints and lymph nodes accounted for more than one-third of admissions. Two decades later, this clinical problem had disappeared, owing to pasteurization of milk and the slaughter of tuberculous cattle, procedures endorsed and enforced by the American Livestock Sanitary Board (1910-35). Pulmonary tuberculosis (1944-52) came under control through isolation, streptomycin, and ancillary therapeutic agents, making pneumothorax, thoracoplasty, and excision of tuberculous lesions largely a matter of history. At the beginning of this century, tuberculosis was the leading cause of death in the United States. Today, it is well down the list. Control of pneumonia with antibiotics has eliminated empyema, a challenging problem for surgeons a few decades ago. Similarly, bronchiecstasis has mysteriously disappeared owing essentially to prevention of a number of childhood infections, especially measles and whooping cough.

Elimination of that frightful crippler poliomyelitis (1953-63) by the vaccination programs of Sabin and Salk is truly one of medicine's great victories. It put aside permanently the important commitment of orthopedic surgeons to repair of consequent incapacitating deformities. Immunization against poliomyelitis came about through the work of Enders and his associates.

Definition by Marine (1926-35) and others of the daily iodine requirements of man, 0.04-0.08 mg. has eliminated endemic goitre and changed materially the address of surgeons to thyroid disease.

Some Outstanding American Contributions from Outside the Academic Arena

There has been a homespun quality to some of America's most significant contributions to medicine's advance. I shall mention a few. In 1809, Ephraim McDowell (1771-1830), Kentucky's frontier surgeon, did the first successful excision of an ovarian cyst. His first publication of 3 successive successful operations appeared in 1817 in the *Eclectic Repertory Analytical Review;* the report met with incredulity in this country and in Britain.

The Army surgeon, William Beaumont initiated experiments on the nature of gastric digestion in man on Alexis St. Martin, French Indian voyageur, injured by a shotgun blast at close range in June 1822. Beaumont succeeded in closing the wound into the left pleural cavity, but the abdominal wound persisted as a gastric fistula. In August 1825, before leaving Mackinac Island in Lake Huron, Beaumont made a few observations on the gastric secretory behavior of his patient's stomach. The major share of his epochal research was performed at Fort Crawford at the juncture of the Wisconsin with the Mississippi River at Prairie du Chien. Beaumont's book (1833) has become a classic in which he established the presence of a "chemical principle" in the gastric juice, observing too that the normal stomach requires the presence of food to elicit secretion of gastric juice, an observation not generally recognized by gastric physiologists until well into the twentieth century. He also correctly identified the acid as hydrochloric, with the help of Robley Dunglison, significant observations and experiments for that period. It remained for Theodor Schwann (1836) in Berlin to identify Beaumont's "chemical principle" as pepsin.

Crawford Long of Danielsville, Georgia, was the first to administer ether to abolish pain during operation in March 1842, excising a subcutaneous neck tumor painlessly, followed later by similar operations. However, he failed to publish until 1849, three years after the first public demonstration of ether for surgery at the Massachusetts General Hospital, October 16, 1846.

J. Marion Sims' significant contribution on the repair of vesico-vaginal fistula (1852) in Montgomery, Alabama, a complication of difficult and protracted labor also participates of the homespun quality of greatness that had defied the finest surgical talent in the world. The knee-chest posture, adequate illumination and exposure, and employment of interrupted fine silver wire sutures solved the problem.

The evolution of the Mayo Clinic, from small beginnings at the turn of this century into the remarkable institution it has become, also partook of the simple unassuming qualities of greatness.

Minnesota has an additional example in the person of Adolph Hanson of Faribault whom many of my generation will remember. Members of my class (1921-22) were accustomed to see Dr. Hanson during his weekly visits to Dr. Hirschfelder's pharmacologic laboratory in Millard Hall. He first developed and published his observations describing an active parathyroid extract in the *Military Surgeon* 52: 280-4, 1923, two full years before Collip's isolation of parathormone in 1925. These unusual and remarkable achievements serve to accentuate the power of an idea, tested and pursued in a homely non-academic environment.

Progress in Management of Heart Disease

Alphonse Dochez (1938), a much respected New York physician, discussed advances in management of heart failure in the 30-year period 1908-38. At the earlier date, physical examination was done, and hematologic studies of the blood and urine studies were made; the blood pressure was taken frequently. No cardiac stimulants were employed. On admission, the patient was bled and actively purged by administration of calomel and saline cathartics! Dochez then reviewed the situation in 1938. Following examination, the patient was put on a salt-poor diet with restriction of fluids, and given digitalis. The patient was weighed every day; the caloric intake was screened and if dyspneic, the patient was given oxygen. Dochez, a scientifically trained clinician, then asked: "Should we return back to more simple techniques and leave the fundamentals to the underlying medical sciences of chemistry, biology, and physiology? Is medicine the spoiled child of philanthropy?" He concluded it was very unlikely that ample resources could be provided to permit each discipline to obtain measures necessary to insure its advance, obviously a very gloomy prediction. It took World War II to provide liberal Federal monies in our country to sponsor research in greater medicine.

For centuries, physicians held uncontested the therapy of cardiac ailments. Advances in paracardiac surgery embracing constrictive pericarditis, patent ductus arteriosus, subclavian to pulmonary artery anastomoses for blue babies, repair of the aortic coarctation, removal of vascular bands about esophagus and trachea—these were some of the significant surgical advances in the management of heart disease before the advent of intracardiac surgery, in which the pioneer American surgeons Edward Churchill, Robert Gross, and Alfred Blalock played significant roles. In repair of arterial aneurysms the contributions of DeBakey, Bahnson, and others have been outstanding.

Intracardiac surgery is unquestionably one of the great advances of this era in which Minnesota surgeons were involved. It all began with John Gibbon of Philadelphia, who commenced to work in the mid 1930s in the laboratories of the Massachusetts General Hospital in Boston on the problem of a pump oxygenator to replace the heart's action during inflow stasis. In May 1953, Gibbon made a successful repair of an interatrial septal defect with use of cardiac bypass and his pump oxygenator. Meanwhile, F. John Lewis at the University of Minnesota under hypothermia had repaired a similar defect in September 1952, the first successful dry-heart operation on man.

The role of the Minnesota surgeons in intracardiac surgery came about in this way: When my good friend and colleague, Maurice Visscher returned to Minnesota in 1936 to succeed Frederick Scott as Professor of Physiology, we began at once interdepartmental weekly physiology-surgery conferences. These were held in one of the lecture amphitheatres of the hospital and were invariably interesting and informative sessions; several were very productive. The work of Fletcher Miller and Richard Varco on the mass spectrograph to assess the concentration of inhaled anesthetic gases was a direct outgrowth of one of those sessions; Alfred Nier of the Department of Physics contributed one of his early models for the studies.

Recognizing the brewing importance of intracardiac surgery and the role of physiology in the resolution of circulatory problems, I began sending a succession of brilliant young surgeons to Dr. Visscher for a stint of one to two and occasionally three years to learn some of the intricacies of the physiologic problems involved. Visscher had worked with Ernest Starling in London on the heart-lung preparation and had a ready familiarity with the problem. Clarence Dennis, Richard Varco, C. Walton Lillehei, K. Alvin Merendino, Herbert Warden, Morley Cohen, Lloyd MacLean, Vincent Gott, Norman Shumway, Christiaan Barnard, and others benefited from this program, and came to play significant roles in the advance of intracardiac surgery. John Kirklin, well known cardiac surgeon of the Mayo Clinic, also lent impetus to the advance of intracardiac surgery, which deserves to be ranked high amongst twentieth century accomplishments in medicine.

The Research Center Approach

Renal transplantation represents interdisciplinary medicine at its very best, involving surgeons, urologists, renal physiologists, hematologists, geneticists, experimental pathologists, and pharmacologists. The Medical Center Research approach represents an array of talent in the solution of challenging clinical problems probably never surpassed, a technique of which we shall undoubtedly see much more during years ahead. Its address to challenging clinical problems will probably become commonplace in the remaining decades of this century in many areas of medicine. My successor in the Chair of Surgery, John Najarian, has developed at Minnesota a strong program of renal transplantation. Thomas Starzl's work with liver transplantation, the most difficult of all transplant endeavors, is progressing. The work of Shumway with heart transplantation is impressive and is steadily gaining ground. When skin can be transferred with survival of allografts, its significance in burn management will rival in accomplishment the more difficult feats of organ transplantation.

Pride in Public Institutions

On the occasion of the Centenary of Harvard's Medical School in 1883, Colonel Henry Lee, speaking for the Board of Overseers said, "Private frugality and public liberality had distinguished this old town of Boston from the days of the good and wise John Winthrop," named first Governor of the Massachusetts Bay Colony in 1630.*

The Harvard story has pertinent lessons for us. The citizens of Minnesota through their legislative body have lent generous support to their University and its Medical School. If Minnesota is to maintain a place of eminence in American or world medicine, more of its affluent citizens must be willing to share their plenitude with good local causes. If all philanthropic citizens of Minnesota matched their largesse to eastern universities to local institutions with worthy local educational ventures, demonstrating a flair for quality and excellence, the continued growth and continuing ascendance of Minnesota Medicine would be assured. If Minnesota citizens come to have the great affection for their University as Bostonians have for their Harvard, Minnesota's University and its affiliate institutions will deserve a place among the world's great educational ventures.

World War II revealed to all the peoples of the globe their complete dependence upon scientific achievement for progress in the stream of time. Over the past three decades since the world wide conflict terrorized peoples everywhere, threatening the very foundations of existence, the importance of research for medicine's advance in all its disciplines has found universal acceptance.

Over the past decade the mood of the White House and our Congress has been to direct support of research primarily to the more frequent causes of death, viz., heart disease, cancer, trauma, and congenital anomalies that account annually for approximately 75 percent of all deaths. Lavish amounts of money are being expended in these areas. Whether money alone can accelerate discovery is problematic. A good 10 cent idea is probably even more important. Thirty years ago, no money was available from any large granting agency for the support of our University-manned cancer detection center. With a fuller appreciation of the importance of early detection in the cure of cancer, the National Institutes of Health appropriates currently millions for such research.

Periods of Lull

Advance in knowledge through research is not a continuously progressive process. There are periods of lull, when enrichment appears at a standstill. These are time intervals in which much can be eked out of existing information by scrutinizing and implementing new applications of established therapeutic measures; witness what obstetricians have done in recent decades by invoking early cesarean section for fetal-uterine positions known to portend protracted and difficult labor. Today, many large obstetrical clinics have had a succession of brilliant successes with such endeavors without mortality; at an earlier period, when cesarean section was implemented only after prolonged and unprogressive labor, the mortality was uniformly high. Similarly by critically adjudicating the causes of maternal mortality in labor, a New England group of obstetricians under the leadership of Jewett of Boston, is making a remarkable impress upon the problem. It has been startling to learn how often intratracheal aspiration from a full stomach has been the cause of death during labor.

This obviously is a technique that can be applied to many challenging clinical problems including surgery. What if our profession in Minnesota, on a voluntary but systematic basis assessed the responsible cause or causes of mortality from appendicitis and a number of other disorders? I am convinced that the salvage in life could be impressive.

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*Boston Med & Surg. J., 109:406, October 25, 1883; J. T. Morse, Memoir of Col. Henry Lee, 1905, pp. 147-60.

Pressing Problems Demanding Solution

As we look about us and note how interlocking segments of science have extended our knowledge of space, permitting men to land on the moon and sending a satellite to explore the planet Mars, one wonders what next? Of problems closer to home, we have yet to succeed in regulating the important problem of rainfall; to control, prevent, or divert tornadoes and violent storms; to nullify earthquakes, to make extraction of salt from sea water practical, an accomplishment that would create gardens and tillable land out of deserts, multiplying food production. And what of population control, perhaps the world's most challenging problem? Ideas and knowledge are still the most undeveloped areas in the world. Will some dreaming Joseph come up presently with a practical and effective means of preventing War? Let us continue to hope that constant preparation and readiness for war will not always be the sole deterrent. We do well to recall the aging Pasteur's prophecy (1892) still awaiting fulfillment: "science and peace will triumph over ignorance and war; nations will unite, not to destroy but to build. The future belongs to him who has done most for suffering humanity."

A dozen years ago, President Lyndon Johnson stressed the role of education in developing the Great Society. Far more important in my view would be development of the Good Society, to which every physician can make an important contribution. Carl Eggers, well known New York surgeon, paid a visit to his native Oldenburg shortly before his death (1956) and was asked to inscribe his name on the City's ledger. He wrote, "It is easy to do good and it makes one so happy." Is that not the great privilege of all in our worthy profession?

Acknowledgment

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Microvascular Surgery—Irons and Woods (page 30)

18. Nomoto H, Buncke HJ, Chater NL: Improved patency rates in microvascular surgery when using magnesium sulfate and a silicone rubber vascular cuff. Plast Reconstr Surg 54:157, 1974.
19. Cobbett J: Small vessel anastomosis: a comparison of suture techniques. Br J Plast Surg 20:16, 1967.
20. Acland R: Thrombus formation in microvascular surgery: an experimental study of the effects of surgical trauma. Surgery 73:766, 1973.
21. Acland R: Prevention of thrombosis in microvascular surgery by the use of magnesium sulphate. Br J Plast Surg 25:292, 1972.
22. Ketchum LD, Wennen WW, Masters FW et al.: Experimental use of Pluronic F68 in microvascular surgery. Plast Reconstr Surg 53:288, 1974.

Thrombotic Thrombocytopenic Purpura—Gundlach and Tarnasky (page 21)

4. Harker LA, Slichter SJ: Platelets and fibrinogen consumption in man. N Engl J Med 287:999, 1972.
5. Amir J, Krauss S: Treatment of thrombotic thrombocytopenic purpura with antiplatelet drugs. Blood 42:27, 1973.
6. Jobin F, Delage JM: Aspirin and prednisone in microangiopathic hemolytic anemia. Lancet 2:208, 1970.
7. Zacharski LR, Walworth C, McIntyre OR: Antiplatelet therapy for thrombotic thrombocytopenic purpura. N Engl J Med 285:408, 1971.
8. Giromini M, Bouvier CA, Dami R, et al.: Effect of dipyridamole and aspirin in thrombotic microangiopathy. Br Med J 1:545, 1972.
9. Cuttner J: Splenectomy, steroids and dextran 70 in thrombotic thrombocytopenic purpura. JAMA 227:397, 1974.
10. Rossi EC, Redondo D, Borges WH: Thrombotic thrombocytopenic purpura. Survival following treatment with aspirin, dipyridamole, and prednisone. JAMA 228:1141, 1974.
11. Faguet GB, King MB: Thrombotic thrombocytopenic purpura: treatment with antiplatelet agents. Am J Med Sci 268:113, 1974.
12. Schwartz J, Rosenberg A, Cooperberg AA: Thrombotic thrombocytopenic purpura: successful treatment of two cases. Can Med Assoc J 106:1200, 1972.
13. Weiss HJ: Antiplatelet drugs—a new pharmacologic approach to the prevention of thrombosis. Am Heart J 92:86, 1976.
14. Weiss HJ, Aledort LM, Kochwa S: The effect of salicylates on the hemostatic properties of platelets in man. J Clin Invest 47:2169, 1968.
15. Danese CA, Valeti CD, Weiss HJ: Protection by aspirin against experimentally induced thrombosis in dogs. Thromb Diath Haemorrh 25:288, 1971.
16. Salzman EW, Harris WH, DeSanctis RW: Reduction in venous thromboembolism by agents affecting platelet function. N Engl J Med 284:1287, 1971.
17. Emmons PR, et al.: Effect of a pyrimidopyrididine derivative on thrombus formation in the rabbit. Nature 208:255, 1965.
18. Harker LA, Slichter SJ: Studies of platelet and fibrinogen kinetics in patients with prosthetic heart valves. N Engl J Med 283:1302, 1970.
19. Cucuianu MP, Nishizawa EE, Mustard JF: Effect of pyrimidopyrimidine compounds on platelet function. J Lab Clin Med 77:958, 1971.
20. Sullivan JM, Kagnoff MF, Gorlin R: Reduction of platelet adhesiveness in patients with coronary artery disease. Am J Med Sci 255:292, 1968.
21. Weily HS, Genton E: Altered platelet function in patients with prosthetic mitral valves. Effects of sulfinpyrazone therapy. Circulation 42:967, 1970.

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See next page for brief summary.

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(Continued on page 70)

Support Groups

Oncology Support Groups for Out-patients

KAREN BAKER*

A valuable service to oncology patients receiving their treatment on an out-patient basis has come into its own in Minnesota hospitals. Support groups which deal directly with the many physical, emotional, and environmental concerns faced by cancer patients have proven their usefulness to the patients, their families, and the health professionals involved.

THERE ARE THREE health care facilities within the seven county metropolitan area of Minneapolis which currently offer out-patient support groups for oncology patients including Hennepin County Medical Center, North Memorial Medical Center, and St. Mary's Hospital. These three programs began in somewhat the same manner—a staff member saw the need and proceeded to do something about it. Patients who are receiving therapy come in to the out-patient or emergency department on a regularly scheduled basis, usually in the morning. Blood tests which must be made prior to administration of the medication take a minimum of one hour, and usually longer, to complete. While the patients waited for the results of the tests, they usually sat in the waiting area. Since it is advantageous to the hospitals to schedule several cases at the same time, there were from 3-15 persons waiting at one time. It was at this point that a staff member realized that these people were just sitting, with their fears, anxieties, and questions.

Although these patients were often in the same situation, they lacked the initiative, motivation, or confidence to begin talking among themselves, and they expressed, either implicitly or explicitly, the desire for group discussions under the guidance of trained health professionals. The groups are usually facilitated by a team consisting of an RN, Chaplain, and Social Worker (See Table A). The only prerequisite of being part of the group is the attending physician's knowledge and/or consent, depending upon the hospital, and that the patient must know that he has cancer, as it is an openly discussed topic. In all three programs, it is necessary for group participants to be receiving their chemotherapy at the respective hospital. This is an effort to provide continuity of care for the patients.

TABLE
Comparative Information

MEDICAL FACILITY	Name of Group	Length of Establishment	Percentage of Participation*	Length of Session	Team Leaders	Group Size
Hennepin County Medical Center	Oncology Out-Patient Support Group	1½ years	35-40%†	One hour	2 RN's Chaplain	1-15
North Memorial Medical Center	Share & Care‡	1 year	50%	One hour	Chaplain RN, Social Worker	3-12
St. Mary's Hospital	Tumor Clinic Group	3 years	89%	One hour	Chaplain RN# Social Worker	3-18

*Patients who are receiving chemotherapy at that facility.
†Many people eligible have reached debilitative stages of the disease, have previous disease problems, are senile, or retarded.
‡Name of group selected by the patients.
#RN has master's degree in psychology, therefore specialized training in counseling and group therapy.

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*Executive Secretary to the President, North Memorial Medical Center, Minneapolis, Minnesota.

*See editorial, page 35.

Response to the Total Person

Meeting other than specific medical problems of hospitalized patients, has not been previously recognized by health care facilities. Even though basic social services have been available, going beyond obtaining funding for the hospital bill, or placing the patient in a nursing home has not been addressed. Only in recent years have the health professionals begun to acknowledge their responsibility in responding to the total human being by dealing with the emotional and social aspects of the illness through programs set up specifically to address the problem of adaptation to the situation.

The circumstances faced by patients who have cancer are rather unique. As the forms of treatment are in a state of flux, and the treatments themselves are relatively new, there is not much expertise in the field from the advantage of past experience. Support is needed for facing the problems arising in daily living outside of the hospital environment, and also in dealing with the particular and sometimes unforeseen side effects of the medications.

Cancer Is Openly Discussed

The groups have all had a very low-key approach, but honesty and openness are strived for. It did not take very long before the patients did open up and start to discuss their feelings, their fears, and also, very importantly, just to converse with the others. At Hennepin County Medical Center, a large percentage of the patients do not have family or friends; therefore, the group is very significant as a social outlet for them. At North Memorial Medical Center, several people within the group have formed strong bonds of friendship with other group members.

Once a person is told that he has cancer, he often loses his self-esteem and the groups are guided by the staff person to prevent any maligning of others within the group. However, the discussions and topics discussed are very unstructured and the staff person only plays the role of guiding and providing information regarding the disease. The group leaders aim to facilitate, rather than implement changes desired.

Literature about death and the stages a person going through toward acceptance of that fact indicates a prescribed pattern. These support groups, who deal so directly with the ever-present awareness of death, do not necessarily follow the stages of the pattern in their discussions. Rather, they allow an opportunity for the individuals to deal with their feelings as they occur and offer an opportunity to share their feelings. The support of other people in the same situation can be a powerful tool in helping families and individuals cope with the difficult changes in life which do occur.

Patients Have Common Concerns

The sessions are designed for mutual support of the members of the group. Common concerns and topics of discussion are: (1) Reaction of family and friends to the disease is often one of distaste, (2) Need to complete unfinished business, (3) Fear of death itself, (4) Coping with side effects of the chemotherapy, (5) Changes in life style due to the disease, (6) Outlook on life and the fact that they are not the only person with that problem, and (7) Hope.

Another important function of the team leaders is to act as an information and referral resource. Often other services are available which could be utilized by the patients, either within the respective institution, or in the community, and special equipment may be necessary and desired.

Casual Group Structure

Patients are allowed to come and go during the sessions. The discussions are often very candid and if a person feels he is not in the mood to participate, there is no pressure placed on him to do so. The consistency of the groups is very fluid. Although patients are welcome to come at any time for group sessions, they usually only come when they are scheduled for a treatment. The group size also may fluctuate during the session for two reasons: (1) The patients may have to leave to receive their medication. (2) Since it is relatively unstructured, if a person does not feel like coming to the group on a given day, or if he desires to leave as the drift of the conversation makes him feel uncomfortable, this is satisfactory. The options are always left up to the patient. The group sessions, however, seem to play such a valuable role for the patients, that they usually make every effort to be there. Family members and friends of the patients are also welcome to sit in during the group discussions, and often do.

In all three cases, there are no charges for the sessions. A specific room is set aside for the groups at North Memorial Medical Center and at

Hennepin County Medical Center, which is not in the vicinity of the treatment area. North Memorial utilizes a meditation room and serves coffee and rolls, and Hennepin County Medical Center utilizes a dining room in the area of the religion department and also serves coffee and rolls. At North Memorial, the patients suggested they take turns bringing the rolls, and they feel more comfortable putting forth that effort rather than having it provided for them. At St. Mary's Hospital, the meetings are held in a small waiting room near the treatment area. Although there are not any patients with other problems in the same room, it is more effective and desirable for a meeting place away from the treatment area.

It is generally agreed that feedback from the patients themselves is difficult to ascertain. However, feedback that has been supplied, either directly or indirectly from patients, or from other family members, has been most appreciative and supportive of the efforts within each group. It was also felt that the patients felt more at ease speaking with the health professionals regarding specific concerns with the disease than with their physicians, primarily because they know the physicians are always busy and rushed for time, whereas the health professionals dealing with the groups have set aside time for this purpose and are available and able to provide answers and information requested. All questions regarding specific problems of individuals are referred to the patient's private physician.

Continuity of relationships is very important in life and not any less important when dealing with oncology patients. Personnel in each facility who deal with the outpatients make an effort to continue to see the patients if they do become hospitalized, even though the persons involved in outpatient care do not routinely provide the inpatient care. It is interesting to note that patients or family members are welcome to call at any time to talk with the health professional, between group meetings or between treatments. The group meetings are held once a week at Hennepin County Medical Center and North Memorial Medical Center and twice per week at St. Mary's Hospital.

Referral Methods and Staff Involvement

Referrals or information regarding the groups is accomplished in several ways. In all three instances, physician support of the concept has been favorable and often referrals will come through the physician. At St. Mary's Hospital and Hennepin County Medical Center letters are sent to new oncology patients on the chemotherapy program, informing them of the group and inviting them to attend. A brochure is in the preparation stage at North Memorial Medical Center which will be distributed by physicians, or by nurses with the authorization of the physician. Authorization from physicians is necessary as the patient must know that he has cancer, which is the prerogative and responsibility of the physician. At St. Mary's, the RN who is involved in the groups also visits the patients during hospitalization before they are placed on the out-patient chemotherapy program, to meet them and to inform them of the out-patient service, verbally and in person.

Staff evaluation is considered very important. The persons who lead the group sessions meet during the same week to review any significant problems or circumstances of the patients seen that week. If a problem is noted that warrants the physician's notification, this is done. There is no charting done on the patient's medical record as a result of the group sessions.

Staff morale in out-patient areas does not seem to present the difficulties that it does on an inpatient basis, where patients are treated on a daily basis. However, involvement in the support groups is open to those health professionals who are interested and is not an assigned type of duty. There is usually an RN, a chaplain, and a social worker involved, although at times, any member of the team may handle the group alone, without the help of the other team members. In all three instances, the staff people involved in this program were satisfied that they have been able to develop their personal interests along this line, with the support and encouragement of their immediate supervisors and/or the administration of the medical facility.

In the final analysis, it is the goal of each group to show that someone does care and is willing to unconditionally accept the individuals involved in the group programs. A very valuable service is being rendered by these three medical facilities, a service which should be available to every oncology patient who is not hospitalized but who receives chemotherapy on an out-patient basis.

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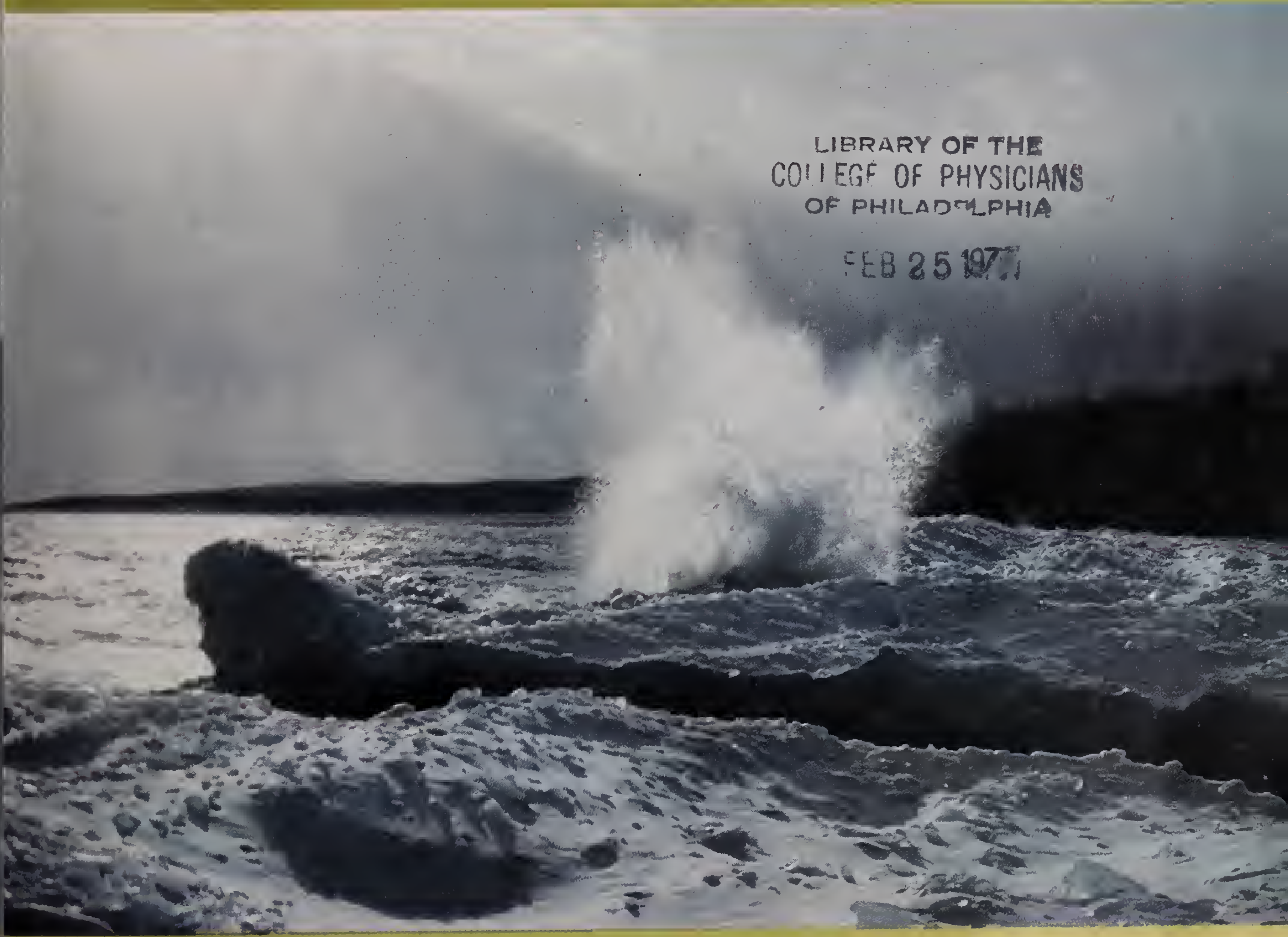

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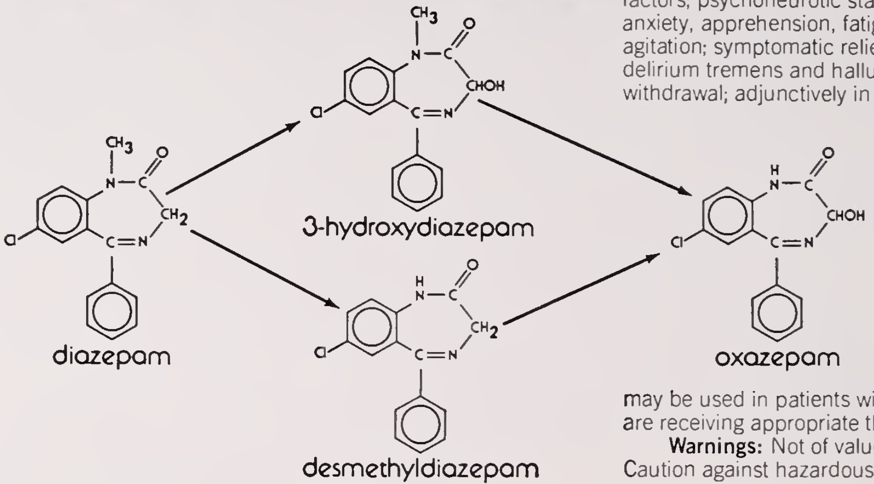

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President's Letter

Weight Loss in Amateur Wrestling

I was recently dismissed at the coach's request from a voluntary position as physician for a local high school athletic program, because I refused to certify H.S. wrestlers' weights, which were considerably below their optimum weights. I strongly and emphatically declared my opposition to the common practice of rapid and significant weight loss among amateur wrestlers in age groups where rapid growth is taking place, particularly when prior to the request the majority of these boys stood before me with lean, muscular, well developed bodies with little evidence of body fat.

The American College of Sports Medicine and the AMA Committee on the Medical Aspects of Sports has long been concerned by the charges that ill-advised and medically hazardous practices of weight control are being practiced. Allegedly, and proven by my own personal experience, some wrestling coaches require growing boys to attain and maintain certified weights considerably below their optimum weights for the season and have advised boys to lose weight suddenly by crash diets and/or by dehydration to retain eligibility at certain weights. After the weigh-in and before the contest, these boys then attempt to regain as much weight as possible.

These two organizations have examined the critical questions in depth. These questions involve the hazards of indiscriminate and excessive weight reduction, the amount of weight that a wrestler can lose safely, defensible means of losing weight, and the weigh-in plan that would best serve the intended purpose.

The AMA Committee published a comprehensive statement on the subject entitled "Wrestling and Weight Control."* In summary, it was noted that any form of dehydration will impair performance for a wrestler. Water deficiency causes premature fatigue, and eventually clinical illness, more rapidly than deficiency of any other nutrient. Professional judgment would best be exercised if coach and physician take as their objective the boy's effective weight level instead of a minimal weight level. For any athlete there is no alternative to a balanced diet at a sustaining caloric level, adequate fluid intake, and high-energy output for attaining and maintaining an effective competitive weight.

The American College of Sports Medicine believes that the potential health hazards created by the procedures used to "make weight" by wrestlers can be reduced if state and national organizations will:

1. Assess the body composition of wrestlers and not allow anyone with less than 5% fat content to compete without medical clearance.
2. Emphasize the importance of eating a balanced diet that meets the daily caloric requirements.
3. Discourage the practice of fluid deprivation and dehydration by:
    - A. Better education of coaches and wrestlers.
    - B. Prohibiting the single or combined use of rubber suits, steam rooms, laxatives, diuretics, etc.
    - C. Schedule weigh-ins just prior to competion.
4. Permit more participants from each team to compete in the weight classes between 119

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*JAMA 201:541, 1976.

and 145 pounds.

5. Schedule competition at championship meets by allowing wrestlers to participate only in those weight classes in which they have the greatest number of matches throughout the season.
6. Encourage the systematic collection of data concerned with the hydration state of wrestlers and its effect on their growth and development.

I will ask the Minnesota House of Delegates in May to reaffirm the position of the AMA and the American College of Sports Medicine that rapid and significant weight loss or unrealistic weight maintenance over protracted periods in amateur wrestlers are practices detrimental to good health and induce potentially serious illness in younger athletes. Hopefully, then we can successfully communicate our concerns to the State High School Athletic League.

Richard E. Anonsen, M.D.
President
Minnesota State Medical Association

'77 Annual Meeting Focuses on Office Practice of Medicine

"Doctor Office Call '77" is the title for the 1977 annual meeting of the Minnesota State Medical Association. The 124th Annual Meeting is set for May 19-20 at the Radisson South Hotel in Bloomington.

The scientific portion of the meeting will concentrate on the office practice of medicine with sessions on:

Dermatology
Urology
Allergy
Surgery
Pediatrics
Endocrinology
Orthopedics
Psychiatry
Gynecology
Financial Planning & Professional Liability
Office Management
Public Health Education
Cardiopulmonary Resuscitation

Registration materials will be mailed to MSMA members in March.

For further information please contact:

Dept. of CME & Program Services
Minn. State Medical Assn.
Suite 900, 101 E. Fifth St.
St. Paul, MN 55101

Editor's Notebook

Low Morale of English Physicians: Will American M.D.'s Suffer Same Fate?

> *"But, whatever recommendations the Royal commission may make, it must be hoped that, if implemented, they will help to restore the morale of the medical profession, which remains depressingly low owing to the continued dispute over private practice, the inequitable effects of the government's pay policy and the uncertain future of many hospital and specialist departments in the light of plans to reallocate resources and manpower."*[1]
>
> John Lister, M.D., London Physician

In 1972 I interviewed an English pathologist in London for an American medical publication.[2] The pathologist supported England's National Health Service, but I found the interview depressing because of (1) the antiquated condition of the hospital where the interview took place; and (2) the pathologist's descriptions of his heavy administrative burdens; of how the system "strangled the initiatives" of doctors; and of how the National Health Service's planned to redistribute patients, physicians, and hospitals.

I shall give an example to illustrate the last point.

The Service planned to have a central 800 bed hospital for every 250,000 people. Eight pathologists—two each in microbiology, clinical chemistry, hematology, and histopathology—would staff each hospital laboratory. For me, at least, such a rigid plan, with a place for everybody and everybody in their place, would be demoralizing.

Royal Commission

Because of this interview, I read with interest Doctor John Lister's essay, "The Royal Commission and the Morale of Medical Profession," in the December 30, 1976 *New England Journal of Medicine*.[1] Lister starts by saying the British government set up a Royal Commission in 1975 to consider "the best use and management of the financial and manpower resources of the National Health Service." The chairman of the Commission asked physicians for their views. He got them. From Lister's essay and other British physicians he quotes:[3-8] it is clear the morale of the English medical profession, after 29 years of the National Health Service, is low.

Complaints

Why? The list of complaints reads like this: poor pay, inadequate fringe benefits, excessive committee work, inflexible bureaucratic procedures, arbitrary decisions, rationing of resources, shifting or eliminating of hospital services, loss of private beds, and reduction of a once proud profession to a trade union.

To give you the flavor of what English doctors are saying, I have selected snatches from back to back articles in the October 23, 1976 issue of *Lancet*.

Here, first, is Doctor T. E. Fox, former editor of *Lancet,* commenting on what the Service has done to Doctors and how the doctors feel about it:[3]

> "In the social revolution the senior professions . . . have lost more than they've gained. Doctors, who seldom have wealth to manipulate, and who lack the fringe benefits common in business, have been hard hit by taxation and inflation. And at the same time their pleasure in their work has been reduced by the Treasury's failure to find enough money for the N.H.S.
>
> "As most doctors see it, the Service suffers also from false economies and from bureaucratic waste; and many consultants have long felt frustrated. Some, indeed, have thought of leaving it altogether. Last year, by way of encouragement, a large new straw was placed on their dispirited backs: they were suddenly told they would lose their pay-beds."

Second, here is J. L. T. Birley, an English psychiatrist, with remarks on the industrialization of Medicine, as manifested by physician strikes:[4]

> "Our behaviour now looks rather undignified, and people are naturally worried that medicine is losing its dignity and its compassion. We are certainly a rather discontented labour force, with a bewildered, impoverished, and unimaginative employer which has been badly advised about its managerial reorganisation."

Effects of Poor Morale

As a politician, you might ask: "What's wrong with poor physician morale as long as citizens are satisfied?" Well, physicians leave the country. Each year there is an "annual net migration of 500 to 600 British-trained doctors."[1] British Medical Schools graduate about 3,000 physicians each year at government expense. So losing 500 to 600 doctors a year creates a considerable cash and brain drain.

Then, too, of course, as a politician you run the risk of physician strikes. This may be an acceptable risk, for England has a good record for keeping costs down by rationing health care (see Table 1). But this is not universally true, and you cannot take it for granted.

In Canada, medical costs have risen faster in years after adopting National Health Insurance in 1968 than before—or than in the United States over the same period.[9]

TABLE 1

Total Expenditures for Health Services as Percent of Gross National Product and Increase in Relative Medical Expenditures.

Country	Total Medical Expenditure as Percentage of GNP*	Average Annual Rate of Increase Minus Annual Increase in GNP+
Canada	7.3	3.3
United States	6.8	2.8
Sweden	6.7	4.2
Netherlands	5.9	4.2
Federal Republic of Germany	5.7	3.3
France	5.7	4.8
United Kingdom	4.8	2.6

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*Simanis, Joseph G.: Medical Care Expenditures in Seven Countries. Social Security Bulletin, Page 39, March, 1973.

†Cooper, Michael H.: Rationing Health Care. New York, John Wiley and Sons, 1975.

Politicians might consider one final point—morale has a great deal to do with performance. In considering National Health Insurance programs, perhaps a balanced bill can be passed that will satisfy patients and physicians. Now that the Carter administration is in power, debate will surely reopen on National Health Insurance Proposals (see Table 2 for the summary of six major proposals), and incentives that will keep doctors performing, i.e. providing quality services, will, or should be, an important part of the debate.

TABLE 2
Six Major Proposals for National Health Insurance

Bill	National Support	Estimated Cost by 1980	Administration	Financing	Benefits
Kennedy-Corman	A.F.L.-C.I.O. Committee for National Health Insurance. (Health Security Act)	$24.8 billion.	Special board within H.E.W.; regional and local offices will operate program.	Half to come from Federal general revenues, half from special taxes; 1 percent of payroll for employees, 2.5 percent for employers and self-employed.	Institutional services: hospital care; skilled nursing facilities up to 120 days. Diagnosis and treatment: physicians' services, lab and X-ray, home health services, prescription drugs (for chronic illness), medical supplies and appliances. Other services: physical checkups, well-child care, maternity, family planning, dental care (up to age 25), vision care and eyeglasses, hearing care and hearing aids. Patient cost-sharing: none
CHIP (Comprehensive Health Insurance Plan)	No formal support.	$11.3 billion.	Insurance through private carriers; states to supervise under Federal regulations.	Employer-employee premium payments, with employer paying 75 percent (65 percent first three years); special provisions for small employers and those with high increases in payroll costs.	Institutional services: hospital care, skilled nursing facilities up to 100 days. Diagnosis and treatment: physicians' services, lab and X-ray, home health services (up to 100 visits), prescription drugs, medical supplies and appliances. Other services: well-child care, maternity, family planning, dental care (under age 13), hearing care and hearing aids (under age 13). Patient cost-sharing: annual deductible* of $150 per person; 25 percent coinsurance,** with annual ceiling of $1,500 per family.
Ullman	American Hospital Association.	$25.1 billion.	Private insurance carriers under state supervision, according to Federal guidelines.	Employer-employee premium payments, with employer paying at least 75 percent; Federal subsidy for low-income workers and certain small employers; patients enrolling in a health-care corporation get 10 percent subsidy.	Institutional services: hospital care up to 90 days, skilled nursing facilities (30 days), health-related custodial nursing home care (90 days). Diagnosis and treatment: physicians' services up to 10 visits, lab and X-ray, home health services (100 days), prescription drugs limited to specified conditions, medical supplies and appliances. Other Services: physical checkups, well-child care, maternity, dental care (under age 13), vision care and eyeglasses (under age 13). Patient cost-sharing: coinsurance** (20 percent) or copayment† (up to $5) on most items; special "catastrophic" provisions become effective when patient's out-of-pocket expenses reach a specified amount.

---

*Deductible: Patient's share of annual medical costs before insurance coverage begins.

**Coinsurance: the percentage of a given bill that is charged to the patient.

†Copayment: a flat rate charged to the insured patient on specific items (such as $2 per office visit).

(Continued on page 78)

TABLE 2 (Continued)
Six Major Proposals for National Health Insurance

Bill	National Support	Estimated Cost by 1980	Administration	Financing	Benefits
Fulton	American Medical Association.	$20.3 billion.	Private carriers provide insurance under state supervision; regulations issued by a new Federal board.	Employer-employee premium payments, with employer paying at least 65 percent; small employers get Federal help as do all employers with unusual payroll cost increases; self-employed pay own premiums but are assisted by income-tax credits computed on a sliding scale (the lower the income, the higher the credits).	Institutional services: hospital care, skilled nursing facilities up to 100 days. Diagnosis and treatment: physicians' services, lab and X-ray, home health services, medical supplies and equipment. Other services: physical checkups, well-child care, maternity, family planning, dental care (under age 18). Patient cost-sharing: 20 percent coinsurance, with an annual maximum of $1,500 per person and $2,000 per family.
Burleson-McIntyre	Health Insurance Association of America.	$11 billion.	Insurance administered by private carriers under state supervision; plan is voluntary	Employer-employee premium payments, the ratios to be negotiated between them; low-income workers pay less; self-employed pay entire premium; all participants eligible for special tax deductions.	Institutional services: hospital care, skilled nursing facilities up to 180 days. Diagnosis and treatment: physicians' services, lab and X-ray, home health care (270 days), prescription drugs, medical supplies and appliances. Other services: well-child care, maternity, family planning, dental care (under age 13, one visit), vision care (under age 13, one visit). Patient cost-sharing: annual deductible of $100 per person; 20 percent coinsurance on all items, with annual family limit of $1,000.
Long-Ribicoff	No formal support.	$9.8 billion.	Employers and employees have two choices: to join Federal insurance program administered by H.E.W., or to buy private insurance from federally approved carriers, under H.E.W. supervision.	Employers pay 1 percent payroll tax and are allowed similar provisions for self-employed.	Institutional services: hospital care, skilled nursing facilities up to 100 days. Diagnosis and treatment: physicians' services lab and X-ray, home health services, medical supplies and appliances. Other services: None. Patient cost-sharing: first 60 days of hospitalization not covered; first $2,000 in family medical expenses not covered.

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*Margoles, Richard J.: National Health Insurance—The Dream Whose Time Has Come. New York Times Sunday Magazine, page 23, January 9, 1977 by permission.

Of these proposals, the Kennedy-Corman bill is perhaps closest to the English National Health Service. First, the bill calls for complete H.E.W. control by a five-member health security board. Second, the benefits are broad, almost free of restrictions found in other proposals. Third, the bill nationalizes the health-care budget. The budget cannot exceed revenues. If the budget exceeds revenues, the bill does not curtail services. Instead, it reduces doctors' and hospital charges.

The Kennedy-Corman bill "rations" health care, just as the English system does. Of current health-care proposals, this bill is most threatening to physicians.

Will American M.D.s Suffer Same Fate?

Will we suffer the same loss of morale and effectiveness as our English colleagues? Probably not for these reasons:

1. The United States is not the United Kingdom. Our economy is much stronger and we would not be entering a National Health System in the same economic shape. England, remember, was nearly destitute in 1948, when the National Health Service was introduced. Many of England's medical problems are economic, rather than being a fault of the Health Service.

2. Nineteen hundred seventy-eight, (the earliest that an American National Health bill is likely to pass) is not 1948, as far as illusions about costs of government health care go. In 1948, the British believed a "free health service" would cost nothing. Somebody would pay, but that somebody would be somebody else. And the rich would pay for the health care of the poor. We now know that national health systems are not "free"—they invariably cost more. We also know the working population and lower middle classes pay a greater proportion of their taxes to support such a system than the rich. So national health insurance is a form of regressive taxation.

3. Government services, the public has learned, are not necessarily more "humane" than private services. Nor does government necessarily perform better. Indeed, the New York City financial collapse, Great Society programs failure and Medicare and Medicaid abuses have taught us that government social welfare programs share ". . . the same confusion, the same lack of performance, the same proliferation of agencies, of programs, of forms, and the same triumphs of accounting rules over results."[10]

I am suggesting the American public is becoming more realistic about what government can do well. This new realism is causing shifts in emphasis in the National Health debate from the comprehensive to the catastrophic approach and from the federal to the state level.[11]

4. The existing American medical "nonsystem" is much stronger and more well-organized than its critics give it credit for. America is a society of strong pluralistic organizations. These organizations include physicians (American Medical Association), hospital executives (American Hospital Administrators), and private carrier (Health Insurance Association of America). In table 2, note that all these organizations have submitted National Health Insurance proposals. All these proposals will be debated, and at least a few aspects of them will probably be incorporated in the proposal that finally passes.

Summary

After 29 years of National Health Service, the morale of the British Medical profession is low because of poor pay, loss of private beds, bureaucracy, and the profession's fears that it must become a trade union to negotiate for doctors' rights. Will the same thing happen to the American medical profession when the United States government passes a National Health proposal?

Because of economic differences between England and the United States, because of American citizens' increasing doubts about the government's ability to run social welfare programs and because of strong organizations already in the American health field, I doubt if the United States Congress will pass as sweeping a National Health bill as that of England. The bill that passes will have conservative aspects and will reflect the belief, growing even in liberal circles, that a central government does not manage comprehensive social-welfare programs well.

References will be found on page 140.

Richard L Reece MD

Book Reviews

ESOPHAGEAL HIATUS HERNIA RATIONALE AND RESULTS OF ANATOMIC REPAIR by Thomas Gahagan, M.D. and Conrad R. Lam, M.D. Charles C. Thomas, Springfield, Illinois. $19.50.

This 178 page monograph on Hiatus Hernia contains a wealth of information on Pathophysiology, Anatomy, Histology, and Surgical Techniques. It is largely based on the experiences at Henry Ford Hospital in Detroit. The review of methods and research reflects largely the senior author's experiences and opinions and makes little attempt to present a balanced view of presently used surgical methods. There are no detailed descriptions or illustrations of the popular operations of Hill nor of the fundoplication operation of Nissen. Conservative, medical, treatment also is only mentioned in passing. There are statements like, "there is, of course, no conservative treatment for the hernia (there is no truss for it!) but only for the effects of associated incompetence of the cardia." And "actually, we must confess to ignorance about the extent of success with medical treatment of patients with symptomatic hiatus hernias."

For the sliding hiatus hernia the author has developed a method of his own. It consists of suturing the phrenico esophageal ligament to the underside of the diaphragm, through a thoracic incision. In addition to the sliding and paraesophageal hernia the authors also introduce a new entity called infra cardia bursa hernia which is a type of paraesophageal hernia to the right of the esophagus.

This monograph draws heavily on discussions in several surgical meetings which were later published and which detract somewhat from a concise presentation of facts. One wonders in view of the profusion of medical writing in our day if a better place for discussion of hiatus hernia would not be found in the Surgical Clinics of North America where a balanced presentation is almost guaranteed by the unbiased pen of the editor.

H. W. Heupel, M.D.
Minneapolis, Minnesota

PSYCHOLOGICAL, SEXUAL, SOCIAL AND VOCATIONAL ASPECTS OF SPINAL CORD INJURY: A selected Bibliography published by the Minnesota Medical Rehabilitation Research and Training Center—#2—July, 1976. $2.95.

This excellent bibliography compiled under the direction of Gary T. Athelstan, Ph.D. brings together a valuable group of references for any health professional dealing with individuals with spinal cord injury. The bibliography is quite thorough in the areas under consideration. The references are from a number of areas which might not normally be picked up or available to medical librarians and this provides an added valuable dimension to the bibliography.

I would recommend this highly for health professionals, counselors, and medical librarians. The project director indicates in the preface that an updated supplement will be available in January, 1977 so that it would seem that the plan is to keep this material current. The bibliography is constructed in such a fashion that additions can be inserted in the initial publication. The bibliography is available through the Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School, 860 Mayo Memorial Building, Box 297, Minneapolis, Minnesota 55455.

Richard R. Owen, M.D.
Minneapolis, Minnesota

SYMPOSIUM ON OVARIAN CARCINOMA, National Cancer Institute Monograph 42, October 1975. 191 pages.

This symposium on ovarian carcinoma goes into great detail with presentations by many nationally and internationally known experts in the field of ovarian carcinoma. The book has much information which is of practical nature and also contains excellent segments of areas which are basically of a research orientation.

The book should be strongly recommended as reading material for anyone who is interested in the field of ovarian carcinoma from a theoretical or therapeutical point of view.

The book certainly reminds one that to adequately treat ovarian carcinoma it must be adequately diagnosed, staged and that therapy should be carried out by experts in the field.

Peter E. Fehr, M.D.
Minneapolis, Minnesota

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NOTE: See following page for full prescribing information.

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It has not been established whether the drug-induced lowering of serum cholesterol or lipid levels has a detrimental, beneficial, or no effect on the morbidity or mortality due to atherosclerosis or coronary heart disease. Several years will be required before current investigations will yield an answer to this question.

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Adult Hypercholesterolemic	1.0-2.0 mg.	1.0-2.0 mg.	4.0-8.0 mg.	4.0-8.0 mg.
Pediatric Hypercholesterolemic	0.05 mg./kg. body weight	0.05 mg./kg.	0.1 mg./kg. body weight	4.0 mg.
Hypothyroid Cardiac	1.0 mg.	1.0 mg.	4.0 mg.	4.0 mg.

Choloxin®
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Description

CHOLOXIN (sodium dextrothyroxine) is the sodium salt of the dextrorotatory isomer of thyroxine. It is chemically described as D-3,5,3′,5′-tetraiodothyronine sodium salt.

Actions

The predominant effect of CHOLOXIN (sodium dextrothyroxine) is the reduction of serum cholesterol levels in hyperlipidemic patients. Beta lipoprotein and triglyceride fractions may also be reduced from previously elevated levels.

Most of the available evidence indicates that CHOLOXIN (sodium dextrothyroxine) stimulates the liver to increase catabolism and excretion of cholesterol and its degradation products via the biliary route into the feces. Cholesterol synthesis is not inhibited and abnormal metabolic end-products do not accumulate in the blood.

Indications

This is not an innocuous drug. Strict attention should be paid to the indications and contraindications.

CHOLOXIN (sodium dextrothyroxine) is an antilipidemic agent used as an adjunct to diet and other measures for the reduction of elevated serum cholesterol (low density lipoproteins) in euthyroid patients with no known evidence of organic heart disease.

The drug is also indicated in the treatment of hypothyroidism in patients with cardiac disease who cannot tolerate other types of thyroid medication.

Before prescribing, note the following: Results from a randomized clinical study have indicated a possible adverse effect when CHOLOXIN (sodium dextrothyroxine) is administered to a patient receiving a digitalis preparation. There may be an additive effect. This additive effect may possibly stimulate the myocardium excessively, in patients with significant myocardial impairment. CHOLOXIN (sodium dextrothyroxine) dosage should not exceed 4 mg per day when the patient is receiving a digitalis preparation concomitantly. Careful monitoring of the total effect of both drugs is important.

It has not been established whether the drug-induced lowering of serum cholesterol or lipid levels has a detrimental, beneficial, or no effect on the morbidity or mortality due to atherosclerosis or coronary heart disease. Several years will be required before current investigations will yield an answer to this question.

Contraindications

The administration of CHOLOXIN (sodium dextrothyroxine) to euthyroid patients with one or more of the following conditions is contraindicated:

1. Known organic heart disease, including angina pectoris; history of myocardial infarction; cardiac arrhythmia or tachycardia, either active or in patients with demonstrated propensity for arrhythmias; rheumatic heart disease; history of congestive heart failure; and decompensated or borderline compensated cardiac status.
2. Hypertensive states (other than mild, labile systolic hypertension).
3. Advanced liver or kidney disease.
4. Pregnancy.
5. Nursing mothers.
6. History of iodism.

Warnings

CHOLOXIN (sodium dextrothyroxine) may potentiate the effects of anticoagulants on prothrombin time. Reductions of anticoagulant dosage by as much as 30% have been required in some patients. Consequently, the dosage of anticoagulants should be reduced by one-third upon initiation of CHOLOXIN therapy and the dosage subsequently readjusted on the basis of prothrombin time. The prothrombin time of patients receiving anticoagulant therapy concomitantly with CHOLOXIN therapy should be observed as frequently as necessary, but at least weekly, during the first few weeks of treatment.

In the surgical patient, it is wise to consider withdrawal of the drug two weeks prior to surgery if the use of anticoagulants during surgery is contemplated.

When CHOLOXIN (sodium dextrothyroxine) is used as thyroid replacement therapy in hypothyroid patients with concomitant coronary artery disease (especially those with a history of angina pectoris or myocardial infarction) or other cardiac disease, treatment should be initiated with care. Special consideration of the dosage schedule of CHOLOXIN (sodium dextrothyroxine) is required. This drug may increase the oxygen requirements of the myocardium, especially at high dosage levels. Treated subjects with coronary artery disease must be seen at frequent intervals. If aggravation of angina or increased myocardial ischemia, cardiac failure, or clinically significant arrhythmia develops during the treatment of hypothyroid patients, the dosage should be reduced or the drug discontinued.

Special consideration must be given to the dosage of other thyroid medications used concomitantly with CHOLOXIN (sodium dextrothyroxine). As with all thyroactive drugs, hypothyroid patients are more sensitive to a given dose of CHOLOXIN (sodium dextrothyroxine) than euthyroid patients.

Epinephrine injection in patients with coronary artery disease may precipitate an episode of coronary insufficiency. This condition may be enhanced in patients receiving thyroid analogues. These phenomena should be kept in mind when catecholamine injections are required in sodium dextrothyroxine-treated patients with coronary artery disease.

Since the possibility of precipitating cardiac arrhythmias during surgery may be greater in patients treated with thyroid hormones, it may be wise to discontinue CHOLOXIN (sodium dextrothyroxine) in euthyroid patients at least two weeks prior to an elective operation. During emergency surgery in euthyroid patients, and in surgery in hypothyroid patients in whom it may not be advisable or possible to withdraw therapy, the patients should be carefully observed.

There are reports that sodium dextrothyroxine in diabetic patients is capable of increasing blood sugar levels with a resultant increase in requirements of insulin or oral hypoglycemic agents. Special attention should be paid to parameters necessary for good control of the diabetic state in dextrothyroxine-treated subjects and to dosage requirements of insulin or other antidiabetic drugs. If sodium dextrothyroxine is later withdrawn from patients who had required an increase of insulin (or oral hypoglycemic agents) dosage during its administration, the dosage of antidiabetic drugs should be reduced and adjusted to maintain good control of the diabetic state.

When either or both impaired liver or kidney function are present, the advantages of CHOLOXIN (sodium dextrothyroxine) therapy must be weighed against the possibility of deleterious results.

Usage in Women of Childbearing Age

Women of childbearing age with familial hypercholesterolemia or hyperlipemia should not be deprived of the use of this drug; it can be given to those patients exercising strict birth control procedures. Since pregnancy may occur despite the use of birth control procedures, administration of CHOLOXIN (sodium dextrothyroxine) to women of this age group should be undertaken only after weighing the possible risk to the fetus against the possible benefits to the mother. Teratogenic studies in two animal species have resulted in no abnormalities in the offspring.

Precautions

It is expected that patients on dextrothyroxine therapy will show greatly increased serum protein-bound-iodine levels. These increased serum PBI values are evidence of absorption and transport of the drug, and should NOT be interpreted as evidence of hypermetabolism; similarly, they may not be used for titrating the effective dose of CHOLOXIN (sodium dextrothyroxine). PBI values in the range of 10 to 25 mcg% in treated patients are common.

If signs or symptoms of iodism develop during CHOLOXIN (sodium dextrothyroxine) therapy, the drug should be discontinued.

A few children with familial hypercholesterolemia have been treated with CHOLOXIN for periods of one year or longer with no adverse effects on growth. However, it is recommended that the drug be continued in patients in this age group only if a significant serum cholesterol-lowering effect is observed.

Adverse Reactions

The side effects attributed to dextrothyroxine therapy are, for the most part, due to increased metabolism, and may be minimized by following the recommended dosage schedule. Adverse effects are least commonly seen in euthyroid patients with no signs or symptoms of organic heart disease; the incidence of adverse effects is increased in hypothyroid patients, and is highest in those patients with organic heart disease superimposed on the hypothyroid state.

In the absence of known organic heart disease, some cardiac changes may be precipitated during sodium dextrothyroxine therapy. In addition to angina pectoris, arrhythmia consisting of extrasystoles, ectopic beats, or supraventricular tachycardia, ECG evidence of ischemic myocardial changes and increase in heart size have been observed. Myocardial infarctions, both fatal and non-fatal, have occurred, but these are not unexpected in untreated patients in the age groups studied. It is not known whether any of these infarcts were drug related.

Changes in clinical status that may be related to the metabolic action of the drug include the development of insomnia, nervousness, palpitations, tremors, loss of weight, lid lag, sweating, flushing, hyperthermia, hair loss, diuresis, and menstrual irregularities. Gastrointestinal complaints during therapy have included dyspepsia, nausea and vomiting, constipation, diarrhea, and decrease in appetite.

Other side effects reported to be associated with CHOLOXIN (sodium dextrothyroxine) therapy include the development of headache, changes in libido (increase or decrease), hoarseness, tinnitus, dizziness, peripheral edema, malaise, tiredness, visual disturbances, psychic changes, paresthesia, muscle pain, and various bizarre subjective complaints. Skin rashes, including a few which appeared to be due to iodism, and itching have been attributed to dextrothyroxine by some investigators. Gallstones have been discovered in occasional dextrothyroxine-treated patients and cholestatic jaundice has occurred in one patient, although its relationship to CHOLOXIN therapy was not established.

In several instances, the previously existing conditions of the patient appeared to continue or progress during the administration of CHOLOXIN (sodium dextrothyroxine); a worsening of peripheral vascular disease, sensorium, exophthalmos, and retinopathy have been reported.

CHOLOXIN (sodium dextrothyroxine) potentiates the effects of anticoagulants, such as warfarin or Dicumarol, on prothrombin time, thus indicating a decrease in the dosage requirements of the anticoagulants. On the other hand, dosage requirements of antidiabetic drugs have been reported to be increased during dextrothyroxine therapy (see WARNINGS section).

Dosage and Administration

For **adult** euthyroid hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is 4 to 8 mg per day. The initial daily dose should be 1 to 2 mg to be increased in 1 to 2 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, if that dosage level is indicated to effect the desired lowering of serum cholesterol.

When used as partial or complete substitution therapy for levothyroxine in hypothyroid patients with cardiac disease who cannot tolerate other types of thyroid medication, the initial daily dose should be 1 mg to be increased in 1 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, preferably the lower dosage. The maximum in patients receiving digitalis therapy is 4 mg.

For **pediatric** hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is approximately 0.1 mg (100 mcg) per kilogram. The initial daily dosage should be approximately 0.05 mg (50 mcg) per kilogram to be increased in up to 0.05 mg (50 mcg) per kilogram increments at monthly intervals. The recommended maximal dose is 4 mg daily, if that dosage is indicated to effect the desired lowering of serum cholesterol.

If new signs or symptoms of cardiac disease develop during the treatment period, the drug should be withdrawn.

How Supplied

CHOLOXIN (sodium dextrothyroxine) is supplied in prescription packages of scored 1, 2, 4, and 6 mg tablets.

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Frozen Section Examination in Surgical Pathology

A Retrospective Study of One Year Experience, Comprising 778 Cases

LOUIS P. DEHNER, M.D.* and JUAN ROSAI, M.D.†

The experience with 778 frozen section examinations at the University Hospitals, University of Minnesota for a twelve month interval are reviewed. Approximately 10% of the cases accessioned in the surgical pathology laboratory during the period have one or more frozen sections performed. Lymph nodes, soft tissues and breast were the specimens most frequently subject to a frozen section examination. A deferred diagnosis was given in 4% of the 778 cases and an error rate of 2%. The procedure and the role of the frozen section are discussion in the light of our experience and that which has been previously reported in other institutions.

THE ROLE OF THE frozen section examination and diagnosis has become as clearly identified with the surgical pathologist as the scalpel with the surgeon. There have been significant changes in the attitude of pathologists and surgeons alike in the utility and necessity of such a method that provides a rapid tissue diagnosis during an operative procedure. It is more than likely that Dr. Malcolm Dockerty would retract some or all of his opening sentence in a paper published in 1953 on the frozen section[1], "The attitude of the busy pathologist responding to a hurried summons from the operating room for purposes of making a 'fresh frozen section' is like his attitude toward a court summons—one of distaste." As an entire generation of pathologists trained in the use and interpretation of the frozen section is now available in most hospitals across the country, many of the anxieties that plagued pathologists when the technique was new and unfamiliar have been put to one side. That is not to say that the procedure can be approached casually and with a certain level of glibness by the pathologist since it represents one of the moments when his interpretation can have a maximum impact upon the care of a patient. His ability to recognize a particular histologic pattern with the attendant artifacts of the frozen section and his judgment in advising the surgeon are placed "on the line."

Since the introduction of the technique of frozen section and the early pleas of MacCarty[2] at the Mayo Clinic that "pathologists open their eyes to a method which will startle them after a little practice," there is seemingly an unrestrained enthusiasm at times among some surgeons. An evaluation of the procedure should be a routine practice in any surgical pathology laboratory in order to examine the efficacy, reliability and accuracy of the frozen section diagnosis and secondly to review the purposes for which the frozen section examination is requested. The single purpose of the frozen section to determine whether a particular lesion is benign or malignant has changed somewhat since Stout discussed the technique in 1956. This paper presents the results of our experience with the frozen section procedure at the University Hospitals, University of Minnesota Medical School for a twelve month period.

Materials and Methods

All frozen sections performed during the period from July 1, 1974 to June 30, 1975 in the Division of Surgical Pathology, Department of Laboratory Medicine and Pathology, University Hospitals, University of Minnesota Medical School were reviewed. There was a total of 1,187 frozen sections on 778 patients processed during this interval (Table 1). In all cases, a senior fellow in Surgical Pathology in a scrub suit was called to the operating room where he or she discussed the case with the surgeon and received the

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TABLE 1
Clinical Services Requesting Frozen Section Consultation
University Hospitals, (1974-1975)

Clinical Service	No. Patients	Percent
General Surgery	504	65
Gynecology	111	14
Otolaryngology	68	9
Neurosurgery	59	8
Urology	23	3
Orthopedics	12	1
Ophthalmology	1	1
Total	778*	100

---

*Total number of frozen sections—1187 (1.5 F.S./case).

fresh tissue, which was taken to the Laboratory together with the hospital chart.

If the fragment of tissue was small, the entire specimen was prepared or alternatively, a representative block was selected from a larger specimen. Every attempt was made to save a portion of tissue in formalin for routine processing, in order to avoid the artifacts of freezing. The tissue was placed in mounting medium on a block and oriented properly before submerging into the coolant. Isopentane was cooled at −20°C in a Dewar flask by an electronic device (Cryocool®, Neslab Instruments, Inc.). After the block had been "faced," sections were cut at six microns, attached to uncoated glass slides and fixed in absolute alcohol, stained in hematoxilin-eosin, dehydrated through graded alcohols, cleared in xylene and mounted in Permount. It generally took no more than ten minutes for the entire procedure after the tissue was brought to the laboratory. Two senior fellows examined the slides and arrived at a diagnosis which was then transcribed to the clinical chart on a specially designed "Frozen Section Consultation" report, a permanent part of the hospital record. If difficulties were encountered by the senior fellows in the diagnosis, the case was referred to one of the "staff" surgical pathologists. When a decision had been reached, the senior fellow returned to the operating room with the clinical chart where he or she discussed the interpretation with the surgeon. A duplicate copy of the "frozen section consultation" was retained in the laboratory where it was filed with the final report.

The diagnosis from the frozen section was compared in each case with that of the final report. In order to quantitate the accuracy of the procedure, it was assumed that the final diagnosis was the correct one. The second phase of the study involved a determination of the necessity of the particular frozen section, as judged by a review of the clinical history and surgical findings. Cases were divided in two basic categories, one in which the interpretation of the frozen section was a determining factor in the surgical procedure and another in which the knowledge of the diagnosis by the surgeon was marginal or noncontributory to the operative procedure. In the former category, the following considerations for frozen section examination were deemed valid: (1) establish immediate tissue diagnosis that dictated or profoundly influenced therapy at or sometime immediately after surgery; (2) confirm that tissue was representative and adequate for diagnosis on permanent sections although immediate therapy was not dependent upon the frozen section diagnosis; and (3) validate adequacy of surgical margins or tissue resection, i.e. vagus nerves, sympathetic ganglia or margins free of tumor involvement.

Results

A total of 7,530 cases were accessioned in the Division of Surgical Pathology from July 1, 1974

TABLE 2
Final Pathologic Diagnoses of Lymph Nodes Submitted for Frozen Section

	Metastatic Carcinoma	Malignant Lymphoma	Granulomatous Inflammation	Hyperplasia	No Pathologic Diagnosis	Total
Cervical - Supraclavicular	16	5	1	10	7	39 (27%)
Iliac - Inguinal	8	3	0	2	17	30 (20%)
Mediastinum	8	1	9	2	3	23 (16%)
Hilar, Subcarinal, Bronchial	6	2	4	3	8	23 (16%)
Abdominal - Periaortic	15	2	0	3	0	20 (14%)
Axillary	1	0	0	7	4	12 (8%)
Total	54 (37%)	13 (9%)	14 (10%)	27 (18%)	39 (27%)	147 (100%)

to June 30, 1975 of which 778 (10%) had one or more frozen sections performed (Table 1). There were 1,187 frozen sections (range one to 12 frozen sections per case) with an average of 1.5 examinations per case. Most frozen sections (65%) were submitted by a member (staff or resident) of the Department of Surgery. The distribution of other clinical services requesting such a consultation has been included in Table 1.

Lymph nodes, soft tissues and breast were the specimens in descending order of frequency most often submitted for frozen section diagnosis.

Lymph Nodes.

There was a total of 147 diagnoses on individual lymph nodes (Table 2). Nearly 50% of the lymph node biopsies came from the cervical, supraclavicular and ilio-inguinal regions. Metastatic carcinoma including malignant melanoma was the commonest diagnosis. In the cervical and supraclavicular lymph nodes, metastatic epidermoid carcinoma from a location in the upper or lower respiratory tract (nasopharynx, hypopharynx, larynx and lung) was the most frequent histologic type of malignancy, followed by metastatic carcinoma from the breast. At the time of frozen section in some cases, however, it was impossible to state unequivocally whether the tumor was a poorly differentiated adeno- or epidermoid carcinoma. Similarly, a diagnosis of undifferentiated malignant tumor was made at the time of frozen section when a neoplasm had a solid pattern of growth consisting of large cells with vesicular nuclei. The distinction between histiocytic lymphoma and lympho-epithelioma in these cases was difficult even in permanent section. The small cell malignant tumor in a supraclavicular, mediastinal or hilar lymph node was another source of problems since the "crush-artifact" of the biopsy was found in normal lymphocytes, cells of poorly differentiated lymphocytic lymphoma, oat cell carcinoma and even medullary carcinoma of the thyroid. Acidophilic necrosis aided in the recognition of a small (oat cell) carcinoma. Metastatic carcinoma in the periaortic lymph nodes was usually from the cervix uteri and the colon, pancreas or stomach when present in other abdominal lymph nodes. The highest frequency of "no pathologic diagnosis" occurred in the ilio-inguinal lymph nodes (57%) (Table 2). In the overall group however, a frozen and permanent section interpretation of "no pathologic diagnosis" was the second most common histologic interpretation (27%) to metastatic carcinoma. Follicular or diffuse lymphoid hyperplasia was diagnosed in 27 cases. Non-

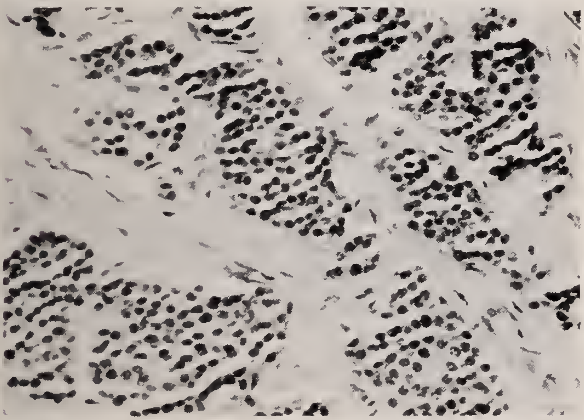

Fig. 1—Multiple peritoneal nodules in right lower quadrant of abdomen diagnosed at frozen section as carcinoid tumor unsuspected in a patient with adenocarcinoma of the endometrium. A mass was later palpated in the terminal ileum. (Hematoxylin and eosin, x 275.)

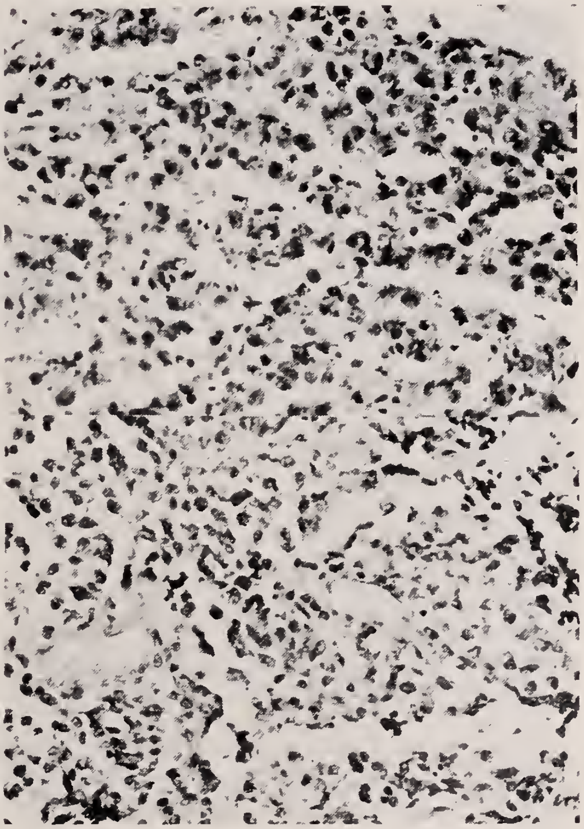

Fig. 2—A highly anaplastic tumor in the anterior mediastinum of a young male with the differential diagnosis at frozen section of malignant germ cell tumor versus malignant lymphoma (top). Nests of large pale cells, a lymphocytic infiltrate and cytoplasmic glycogen confirmed the diagnosis of seminoma on permanent sections (bottom) (Hematoxylin and eosin, x 275).

caseous granulomatous inflammation without identifiable micro-organisms in subsequent special stains was noted in fourteen biopsies, thirteen from the mediastinum or peribronchial lymph nodes. Six of the thirteen lymph nodes containing malignant lymphoma were Hodgkin's disease (five-cervical, supraclavicular; one-mediastinal). The subclassification of a malignant lymphoma was generally done on the permanent sections. If the diagnosis was strongly suspected at frozen section, a request for additional nodal tissue for direct formalin fixation was made in order to avoid the artifact associated with the freezing process. Another procedure routinely performed at the time of the frozen section was a touch imprint of the lymph node.

Soft Tissues

The peritoneum, omentum and mesentery were the soft tissues of the abdominal cavity from which 52% of the diagnoses from soft tissue sites were made (Table 3). Implants or direct extension of a tumor originating from a gastrointestinal, ovarian or renal primary location were present in the 25 frozen section biopsies. A previously unrecognized carcinoid tumor of the terminal ileum was diagnosed in the frozen section of an omental implant (Figure 1). The patient, an elderly female, was undergoing a total abdominal hysterectomy for a well-differentiated adenocarcinoma of the endometrium. Metastatic tumor, usually carcinoma, was the most frequent diagnosis in the overall group of soft tissue biopsies. A variety of tumors with specific problems in differential diagnosis was encountered in the category of "other lesions." One of these was a seminoma of the anterior mediastinum in a young male. A resection of the mass was not contemplated if the neoplasm proved to be something other than a thymoma. Otherwise, irradiation therapy was considered the treatment of choice. A diagnosis of "malignant germ cell tumor" versus malignant lymphoma was made on a neoplasm showing rather large, bizarre cells with vesicular nuclei and prominent nucleoli (Figure 2). The exclusion of a thymoma served the purpose of the frozen section in this particular case. With the assistance of periodic acid-Schiff stains on the permanent sections, it was concluded that the tumor represented a seminoma characterized by diastase-labile glycogen in the cytoplasm.

TABLE 3
Final Pathologic Diagnoses of Soft Tissues Submitted for Frozen Section

Anatomic Site	Metastatic Tumor	Inflammation - Fibrosis	No Diagnosis	Other Lesions	Total
Intra-abdominal	25	18	16	Malignant lymphoma (1); embryonal rhabdomyosarcoma (1); myxoid liposarcoma (1); carcinoid (1); hematoma (1); cyst (1)	65 (52%)
Head and neck	5	3	4	Fibromatosis (1); plexiforn neurofibroma (1); lymphangioma (1); thyroglossal and branchial cleft cysts (2)	17 (13%)
Lower extremity	2	3	2	Fibroxanthosarcoma (1); synovial sarcoma (1); ganglion (1); vascular leiomyosarcoma (1)	11 (9%)
Retroperitoneum	2	2	0	Leiomyosarcoma (3); pleomorphic liposarcoma (1); chondrosarcoma (1)	9 (7%)
Mediastinum	0	3	1	Neurilemmoma (1); ganglioneuroma (1);neuroblastoma (1); seminoma (1)	8 (6%)
Chest wall	3	1	0	Malignant lymphoma (1); lipoblastomatosis (1)	6 (5%)
Sacrum; buttock	1	2	0	Fetal lipoma (1); fibroxanthosarcoma (1)	5 (4%)
Upper extremity	0	1	1	Myxoid liposarcoma (1)	3 (2%) 3 (1%)
Orbit	0	2	0		
Total	38 (30%)	35 (28%)	24 (19%)	29 (23%)	126 (100%)

Breast

Among the 81 diagnoses of breast lesions submitted for frozen section, fibrocystic disease (mammary dysplasia) and related changes such as sclerosing adenosis and apocrine metaplasia were present in 36% of cases (Table 4). There were 16 examples (19%) of primary carcinoma including the in-situ and infiltrating types. One breast mass in a woman with previously diagnosed chronic myelogenous leukemia (not in blastic crisis at the time) posed significant difficulties necessitating a deferred diagnosis. A pattern of diffusely infiltrating tumor cells and a suggestion of an "Indian-file" pattern raised the possibility of small cell or infiltrating lobular carcinoma. However, the chloroacetate-esterase stain (Von Leder) performed on the permanent sections showed that the lesion was a leukemic infiltrate.

Female Genital System

In the female reproductive system, ovarian and vaginal tissues were the most commonly examined specimens (Table 5). A partially cystic, enlarged ovary was the gross appearance in 26 of the 34 ovaries (76%) submitted for frozen section. With the exception of the three papillary

TABLE 4
Final Pathologic Diagnosis of Breast Submitted for Frozen Section

Diagnosis	No.	Percent
Fibrocystic Disease	29	36
Fibroadenoma	13	16
Fibrosis	11	14
Infiltrating Duct Carcinoma	10	12
Infiltrating Lobular Carcinoma	3	4
Intraductal Papilloma	3	4
No Pathologic Diagnosis	3	4
Gynecomastia	2	2
Lactating Adenoma	2	2
Juvenile Hypertrophy	1	1
Chronic Myelogenous Leukemia	1	1
Colloid-Infiltrating Duct Carcinoma	1	1
Intraductal Papillary Adenocarcinoma	1	1
Well-differentiated Adenocarcinoma	1	1
Total	81	100

TABLE 5
Final Pathologic Diagnosis of Gynecologic Lesions Submitted for Frozen Section

Site	Diagnosis	No.	Total (%)
Ovary	Corpus luteum, luteal cyst	10	34 (49%)
	Endometriosis	3	
	Cyst, simple and follicular	2	
	Cystic teratoma; struma ovarii	2	
	Serous and mucinous cystadenoma	3	
	Thecoma-fibroma, cystadenofibroma, leiomyoma	5	
	Carcinoma	6*	
	Miscellaneous	3	
Vagina	Epidermoid carcinoma	8	14 (20%)
	Adenocarcinoma	2†	
	Carcinoma in situ	1	
	Dysplasia	1	
	No pathologic diagnosis	1	
	Malignant lymphoma	1	
Corpus uteri	No pathologic diagnosis	4	8 (11%)
	Polyps	1	
	Adenocarcinoma	1	
	Leiomyoma	1	
	Decidua, necrosis	1	
Vulva	Epidermoid carcinoma	5	7 (10%)
	Verrucous carcinoma	1	
	Carcinoma in situ (Bowen's disease)	1	
Cervix uteri	No pathologic diagnosis	2	4 (6%)
	Acute and chronic inflammation	1	
	Adenosquamous carcinoma	1	
Fallopian tube	Carcinoma, inflammation, no pathologic diagnosis	3	3 (4%)
	Total		70 (100%)

---

*Cystadenocarcinoma (three), malignant Brenner tumor (one), mesonephric carcinoma (one), metastatic breast carcinoma (one).

†Clear cell (mesonephric) adenocarcinoma; metastatic carcinoma, colon.

serous cystadenocarcinomas and one mesonephric carcinoma, the remaining cysts were benign, representing a combination of functional cysts (follicular and luteal), surface-derived epithelial tumors (serous and mucinous cystadenomas) and mature cystic teratomas. The hemorrhagic corpus luteum and luteal cyst were difficult for the surgeon to recognize without confirmation by frozen section as evidenced by the ten cases in this group. In some instances, the histogenesis of a hemorrhagic cyst was not immediately obvious at frozen section and a diagnosis of "benign hemorrhagic cyst" was made. Endometriosis and hemorrhagic luteal cyst were the usual final diagnoses, less often a serous cystadenoma with hemorrhage. When vulvar or vaginal tissues were examined, the adequacy of the surgical margins for an invasive or in-situ epidermoid carcinoma was the usual indication.

Digestive System

The gastrointestinal tract, liver, pancreas and extrahepatic biliary system accounted for 100 diagnoses at frozen section (Tables 6 and 7). A primary malignant or metastatic tumor was the most prevalent interpretation (47%) in the combined group represented in Tables 6 and 7. An inflammatory process with or without ulceration was identified in twelve cases from the gastrointestinal tract and seven from the liver, pancreas and extrahepatic biliary system. There was concern about a lymphocytic or granulomatous inflammatory reaction at the margins of resection in the six cases of Crohn's disease (granulomatous enterocolitis). Biopsies from the extrahepatic

TABLE 8
Final Pathologic Diagnosis of Lower Respiratory Tract Lesions Submitted for Frozen Section

Diagnosis	No.	Percent
Epidermoid Carcinoma	11*	21
Metastatic Carcinoma	11	21
Granuloma	9	17
Interstitial Fibrosis	4	7
Small Cell (Oat Cell) Carcinoma	4	7
Metastatic Sarcoma (osteosarcoma - one, neurofibrosarcoma - two	3	6
Adenocarcinoma	3	6
Lymphoma - Leukemia	2	4
No Pathologic Diagnosis	2	4
Carcinoid	1	2
Fibrous Mesothelioma	1	2
Multiple Bronchogenic Cysts	1	2
Chondromatous Hamartoma	1	2
Total	53	100

---

*One case Muccepidermoid carcinoma)

TABLE 6
Final Pathologic Diagnosis of Gastrointestinal Lesions Submitted for Frozen Section

	Inflammation, nonspecific	Ulcer	Crohn's Disease	Carcinoma Primary-metastatic	Other Tumors	Ganglion Cells (R/O Hirsch-sprung's Disease)	TOTAL
Esophagus	0	0	0	2 (1/1)	1*	0	3
Stomach	0	5	0	6 (5/1)	2†	0	13
Small Intestine	4	0	5	10 (3/7)	1‡	1	21
Appendix	2	0	0	0	0	0	2
Large Intestine	1	0	1	3	1#	7 (2)	13
Total	7 (13%)	5 (10%)	6 (12%)	21 (40%)	5 (10%)	8 (15%)	52 (100%)

---

*(Leiomyoma)
†(Undifferentiated Malignant Tumor, Carcinoid)
‡(Brunner's Gland Adenoma)
#(Hyperplastic Polyp)

TABLE 7
Final Pathologic Diagnosis of Liver, Pancreas and Extrahepatic Biliary Tract Submitted for Frozen Section

	Inflammation, nonspecific	Metastatic carcinoma	Primary carcinoma	Others	No pathologic diagnosis	Total
Liver	1	15	2	13*	6	37 (77%)
Pancreas	2	0	4†	0	0	6 (13%)
Gallbladder and bile ducts	4	0	1	0	0	5 (10%)
Total	7 (15%)	15 (31%)	7 (15%)	13 (27%)	6 (13%)	48 (100%)

---

*(Fatty change—four, Nodular Hyperplasia—two, Cyst—two, Lymphoma—two, Non-caseating Granuloma—one, Cavernous Hemangioma—one, Reidel's Lobe—one.)
†(Adenocarcinoma—three, Islet Cell Tumor—one.)

biliary tract and pancreas were principally taken to distinguish chronic inflammatory disease from well-differentiated adenocarcinoma. Irregularity of glands, cytologic atypia and invasion of perineural spaces were the major features of the well-differentiated adenocarcinoma.[3]

Respiratory Tract

The diagnosis of a malignant tumor either primary or metastatic was established in 35 of the 53 lesions (65%) from the lower respiratory tract submitted for a frozen section (Table 8). The rationale for frozen section in the cases of the epidermoid and small cell carcinomas was confirmation of diagnostic tissue in the bronchoscopic biopsy. There was one bronchial carcinoid in the group of 53 cases which demonstrated the interpretative problems in the differentiation of oat cell carcinoma from the usual carcinoid tumor in a limited specimen. The "crush artifact" so frequently encountered in the biopsy of an oat cell carcinoma was present but the cells in the carcinoid were not as hyperchromatic nor were foci of acidophilic necrosis noted.

Central Nervous System

A neoplasm of neurogenic origin was the most frequent histologic type of central nervous system tumor submitted for frozen section (Table 9). Glioblastoma multiforme (grades III-IV) and astrocytoma (grade I-II) accounted for approximately 50% of the diagnoses. Cytologic atypia, mitotic activity, cellular crowding and palisading, endothelial hyperplasia and focal necrosis were the microscopic features taken into account to distinguish a high grade from a low grade astrocytic tumor. Some indication of the degree of malignancy of the astrocytic neoplasm was conveyed in the report to the surgeon. The differential diagnosis of reactive gliosis from a grade I astrocytoma was very difficult in one case. Other areas of difficulty in this group of frozen sections included the distinction between the fibrous meningioma and schwannoma in the region of the cerebello-pontine angle, metastatic carcinoma and glioblastoma multiforme; the hemangioblastoma, angioblastic meningioma and metastatic renal cell carcinoma; and, in children, medulloblastoma and cellular ependymoma of the fourth ventricle. In some instances, the final answer had to await permanent sections or even ultrastructural examination.

TABLE 9
Final Pathologic Diagnosis of Central Nervous System Lesions Submitted for Frozen Section

Diagnosis	No.	Percent
Glioblastoma Multiforme	12	24
Astrocytoma	11	22
Schwannoma	6	12
Meningioma	5	10
Metastatic Carcinoma	3	6
Medulloblastoma	2	4
Hemorrhage, Infarct	2	4
Undifferentiated Malignant Tumor	2	4
No Pathologic Diagnosis	2	4
Angiomatous Malformation	1	2
Ependymoma	1	2
Teratoma (IV ventricle, newborn)	1	2
Ganglioglioma	1	2
Epidermoid Cyst	1	2
Total	50	100

Endocrine System

Adenomatous hyperplasia or adenoma was diagnosed in 72% of the biopsies from the endocrine system (Table 10). It was often impossible to differentiate a follicular adenoma from a multinodular goiter or nodular hyperplasia in a limited sampling of a thyroid nodule at frozen section. A well-differentiated follicular adenocarcinoma was not encountered in this group. However, vascular and capsular invasion should be carefully looked for whenever there is a "follicular process" of the thyroid. Chief cell hyperplasia of the parathyroids in nine patients with hyperparathyroidism (five-primary, four-secondary) was documented through frozen section examination. The weight and dimensions of the specimens were recorded in all cases prior to section-

TABLE 10
Final Pathologic Diagnosis of Endocrine System Lesions Submitted for Frozen Section

	Adenomatous Hyperplasia	Adenoma	Inflammation	Carcinoma	Cyst	NPD*	Total
Thyroid	11	7	8	2	1	0	29
Parathyroid	9	0	0	0	0	0	9
Pituitary	0	2	0	0	0	1	3
Adrenal	1	0	0	0	0	0	1
Total	21 (50%)	9 (21%)	8 (19%)	2 (5%)	1 (2%)	1 (2%)	42 (100%)

*No pathologic diagnosis.

ing in the cryostat. Before a commitment to a diagnosis of parathyroid hyperplasia or adenoma at frozen section, a second gland was requested and examined in each case. The parathyroids were diffusely or nodularly hypercellular, though not uniformly, in all cases of hyperplasia. Small nodules of thyroid tissue and lymph nodes were the specimens most frequently submitted from the neck as possible parathyroid. An uncommon problem was the distinction between thyroid and parathyroid tissue that required a periodic acid-Schiff stain with diastase digestion in permanent sections to identify the follicular structures as parathyroid. Small cellular aggregates of ectopic thymic tissue were other potential sources of confusion. These nests of thymus also simulated chemoreceptor or glomus tissue. There were two chromophobe adenomas of the pituitary and one case of bilateral adrenal cortical hyperplasia in this series. Hashimoto's and/or lymphocytic thyroiditis were the only inflammatory lesions of the endocrine system diagnosed at frozen section and therefore, an interpretation of "lymphocytic thyroiditis" was made at that time. A prominent lymphocytic infiltration was noted in the parenchyma in some cases of diffuse and nodular hyperplasia. Both malignant tumors of the endocrine system in the group of frozen sections originated in the thyroid (medullary carcinoma, one; papillary carcinoma, one). The medullary carcinoma was composed, in part, of small hyperchromatic cells infiltrating the soft tissues of the neck. Amyloid was identified later in the permanent sections. The cord-like arrangement of cells permitted the differentiation from malignant lymphoma and small cell carcinoma of the thyroid. There was a cyst of the thyroid which probably represented a totally degenerated nodule or adenoma.

Head and Neck Region.

The parotid gland, oral cavity-oropharynx and ear-mastoid were the sites of biopsy in the head and neck region most frequently submitted for frozen section (Table 11). Epidermoid carcinoma was diagnosed in 16 (42%) cases. In the majority of instances, the margins of resection were evaluated with the intraoperative histologic examination. Epithelial atypia, ulceration, bizarre-appearing fibroblasts and inflammation in the wake of pre-operative irradiation therapy often complicated the identification of residual tumor.

Others

Other organs and tissues submitted for frozen section included sympathetic ganglia (13 cases), vagus nerve (five cases), bone (10 cases), testis (eight cases) and kidney (five cases). The diagnoses at frozen section of the ten orthopedic cases were metastatic carcinoma (three), osteosarcoma (two), chondroblastoma (two), unicameral (simple) bone cyst (one), Ewing's sarcoma (one) and histiocytosis X (one). Immature or prepuberal testes from a small biopsy at the time of orchiopexy was the diagnosis in three of the eight cases. Infarct (one), seminoma (two), teratocarcinoma (one) and hypoplasia (one) were the remaining diagnoses at frozen section. Rejection of a transplanted kidney was documented in four of the five renal biopsies and a normal donor kidney in the fifth case.

Accuracy

The overall accuracy rate was 94% when based upon the 778 cases and 96% when calculated

TABLE 11

Final Pathologic Diagnosis of Head and Neck Lesions Submitted for Frozen Section

		No.
Parotid Gland		11 (29%)
Pleomorphic adenoma	6	
Chronic Inflammation	2	
Acinic Cell Carcinoma	1	
Hemangioma	1	
No Pathologic Diagnosis	1	
External and Middle Ear—Mastoid		6 (16%)
Epidermoid Carcinoma	2	
Meningioma	1	
Neurilemmoma	1	
Acute and Chronic Inflammation	1	
Cholesterol Granuloma	1	
Oral Cavity—Oropharynx		6 (16%)
Epidermoid Carcinoma	4	
Acute and Chronic Inflammation	2	
Nasopharynx		4 (11%)
Epidermoid Carcinoma	3	
Cylindric Cell Papilloma	1	
Hypopharynx (Pyriform Sinus)		3 (8%)
Epidermoid Carcinoma	3	
Larynx-Trachea		3 (8%)
Epidermoid Carcinoma	2	
Undifferentiated Carcinoma	1	
Lip		3 (8%)
Epidermoid Carcinoma	1	
Actinic Keratosis	1	
Skeletal Hemangioma	1	
Paranasal Sinuses		2 (5%)
Epidermoid Carcinoma	1	
Metastatic Carcinoma (Breast)	1	
Total		38 (100%)

on the 1,187 individual frozen sections. Conversely, the error rate was 2% and 1.4%, respectively. Three principal categories of errors which have been summarized in Table 12 were recognized in this series. There were sampling errors in six cases, five of which were associated with the determination of tumor at the margins of resection. A bulky, gelatinous tumor of the breast initially reported as colloid carcinoma was later shown to contain infiltrating duct carcinoma in the same mass. There were three cases in which deeper levels from the original block at frozen section contained microscopic findings at variance with the initial sections. Failure to correctly identify the basic pathologic process occurred in eight cases. These frozen sections all involved a neoplastic process. A change from a benign to a malignant diagnosis was the situation in four cases, including an intraductal papillary neoplasm of the breast (Figure 3). A tumor in the neck composed of small, lymphoid-appearing cells was interpreted as malignant lymphoma on frozen section. However, the permanent sections were diagnosed as a poorly differentiated adenocarcinoma. Ultrastructural examination later confirmed that the neoplasm was lymphocytic, not epithelial.

A diagnosis was deferred in 32 (4%) of 778 cases. Lymph nodes and soft tissues were the specimens most frequently subject to a deferred diagnosis (Table 3). In six of the twelve lymph nodes, diffuse or follicular hyperplasia was the final diagnosis. An atypical fibrous or mesothelial reaction with inflammation on a serosal surface simulating a neoplasm was responsible for a deferred diagnosis in four of eight cases from the soft tissues. There were six tumors of the central nervous system whose final diagnoses were delayed to permanent sections. Bone, breast, vagina, thyroid and skin were represented by one case each in the category of deferred diagnosis (Table 13).

Justification

The final area to be examined in this series was the justification for the frozen section. There were two basic categories in which the frozen sections were divided and these have been defined elsewhere (Materials and Methods). Among the 778 cases, the diagnosis had immediate therapeutic importance in 345 (44%). The frozen section confirmed the presence of diagnostic tissue in 107 cases (14%). Another biopsy or extension of the operative procedure would have occurred if the results of frozen section were negative. In 326 cases (42%) the definitive operative procedure had been performed at the time when the frozen section was requested. Knowledge of the diagnosis was unimportant in the management of the patient during or immediately after surgery.

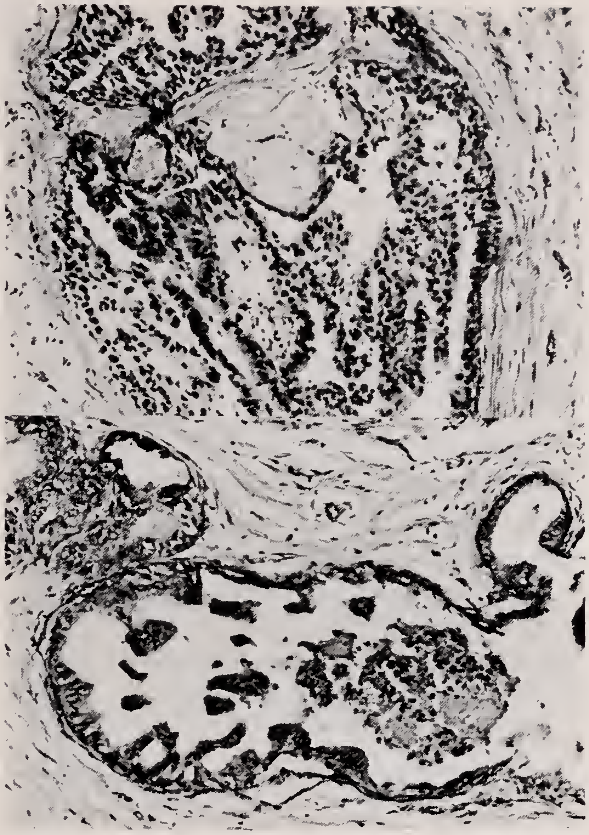
Fig. 3—The definitive diagnosis of this intraductal papillary neoplasm of the breast in an elderly female was deferred at frozen section because of the focal stromal support of the papillae and absence of necrosis (top). A single layer of atypical cells lining the ducts and necrotic material within the lumen in the permanent sections were typical of intraductal carcinoma (bottom) Simple mastectomy was performed (Hematoxylin and eosin, x 100).

Discussion

The frozen section examination obviously represents an extremely important method for the surgeon to obtain a rapid and hopefully reliable histologic interpretation during an operative procedure. A somewhat cavalier attitude has emerged because of the easy accessibility of the frozen section in most hospital laboratories. The single, most important purpose of the frozen section was

TABLE 12
Summary of Diagnostic Errors at Frozen Section Examination

Anatomic Site and Final Diagnosis	Specific Type of Frozen Section Error
Nasopharynx—cylindric cell papilloma	Interpreted as non-neoplastic polyp
Soft tissue of neck—adenocarcinoma	Interpreted as malignant lymphoma
Liver—malignant lymphoma	Interpreted as benign (abscess vs. granuloma)
Liver—metastatic well-differentiated adenocarcinoma	Interpreted as benign cyst
Stomach—adenocarcinoma of linitis plastica type	Presence of tumor at surgical margins was missed
Lung—leukemic infiltrate	Interpreted as inflammatory
Brain—glioblastoma multiforme	Interpreted as metastatic carcinoma
Breast—intraductal papillary adenocarcinoma	Interpreted as intraductal papilloma
Oral cavity—squamous cell carcinoma	Presence of tumor at surgical margins was missed
Skin—squamous cell carcinoma (2 cases)	Presence of tumor at surgical margins was missed
Skin—metastatic carcinoma from breast	Presence of tumor at surgical margins was missed
Rectum—adenocarcinoma	Presence of tumor at surgical margins was missed
Breast—mixed mucinous and infiltrating duct carcinoma	Only the mucinous component was identified
Soft tissue—squamous cell carcinoma	Tumor not present in the frozen section slide
Vagina—squamous cell carcinoma with carcinoma in situ at the surgical margin	Presence of carcinoma in situ at the surgical margin not present in the frozen section slide
Prostate—adenocarcinoma plus nodular hyperplasia	Only the nodular hyperplasia was present in the frozen section slide

TABLE 13
Summary of Deferred Diagnosis at Frozen Section

Site or tissue biopsied	Total No.	Final Diagnosis	
Lymph Nodes	12 (38%)	Lymphoma or other lymphoreticular neoplasm	5
		Hyperplasia	6
		No pathologic diagnosis	1
Soft tissues	8 (25%)	Inflammation, fibrosis	4
Mediastinum (3)		Seminoma	1
Mesentery (2)		Hodgkin's disease	1
Back (1)		Vascular Leiomyosarcoma	1
Lower extremity (1)		No pathologic diagnosis	1
Pleura (1)			
Brain	6 (19%)	Astrocytoma	2
		Glioblastoma multiforme	1
		Meningioma	1
		Medulloblastoma	1
		Ganglioglioma	1
Bone	2 (6%)	Histiocytosis	1
		Metastatic carcinoma	1
Breast	1 (3%)	Chronic myelogenous leukemia	1
Vagina	1 (3%)	Poorly differentiated lymphocytic lymphoma	1
Thyroid	1 (3%)	Follicular adenoma	1
Skin	1 (3%)	Epidermoid carcinoma (in EBD).*	1
Total	32 (100%)		32

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*Epidermolysis bullosa dystrophica.

clearly and succinctly stated by Ackerman and Ramirez[4]: "to make a therapeutic decision." Satisfaction of the surgeon's curiosity will *never* reasonably justify a request for the frozen section. The pathologist is too often the recipient of a gross specimen that represents the end-result of the definitive procedure. It is imperative in this and all other cases that the pathologist and surgeon have a clear dialogue about the need for the frozen section. In the same context, the surgeon as well as the pathologist should be aware of the limitations of the frozen section that involves the procedure itself and at times, the experiences of the pathologist. There is a mistaken and naive idea among some physicians that every frozen section should produce a precise histopathologic diagnosis. Certainly, a precise interpretation is desirable; however, in most operative situations, a "benign" or "malignant" diagnosis is sufficient for the needs of the case.

Every institution's experience with a particular procedure varies somewhat and the frozen section is no exception. The University Hospitals of the University of Minnesota differ quite markedly from most community hospitals in the type of patient-problem which they handle and therefore some of the experiences must be judged accordingly. A comparison between large collected series from other University medical centers and our own demonstrates some differences.[5-8] Whereas the breast was usually the most common anatomic site subject to frozen section examination, it was third in our series preceded by lymph nodes and soft tissues. The soft tissues representing various regional locations were second in frequency as it was the case in the series from Barnes Hospital, St. Louis.[6] Thyroid and lung occupied the second position in the other reviews of frozen sections from Columbia University, New York and Ohio State University-University of Texas, Galveston.[7,8] The gastrointestinal tract was another frequent site for biopsy-frozen section in our series and others. It should be noted that metastatic tumor (carcinoma, melanoma and sarcoma) was the most common diagnosis in lymph nodes and soft tissues. Many of the patients referred to our hospital have a histologically confirmed neoplasm at the time of admission but have been sent to this institution with the hope of further definitive therapy. The biopsy of these patients was performed in most cases to establish the potential and feasibility for additional surgery. Other studies such as cell-surface characterization, tissue culture and electron microscopy were employed when the histogenesis of the neoplasm was in question. This series also reflected the fact that relatively few uncomplicated breast lesions were referred to the University Hospitals. On the other hand, approximately one-third of the supraclavicular nodes with metastatic adenocarcinoma originated from the breast.

More important than the epidemiologic type of information provided by such an analysis of a surgical pathology laboratory's experience with frozen sections, this study required us to appraise the accuracy of the procedure as a method of quality control. The rate of error in our series was 2% as computed on the basis of 778 cases or 1.4% on the basis of 1,187 frozen sections. This figure compared favorably with the 0.7-2.5% that has been reported previously in the literature.[6-8] The number of "deferred diagnosis" has not been included as was the practice in the other series. Lymph nodes and soft tissues represented the major sources of the "deferred diagnoses."

The indications for the frozen section have been discussed in the past at length by many authors[4,9,10] and as stated earlier in this paper, the basic one is the establishment of a pathologic diagnosis for an immediate therapeutic decision. Unfortunately, this principle is often violated by the surgeon. The frozen section, on occasion, has substituted for the anticipated tardy final pathologic report. If this is the case, then the pathologist needs to examine the efficiency of his laboratory. The danger of implantation of tumor and limited quantities of diagnosable tissue are two potential contra-indications to frozen section according to Horn.[11] It is well for the pathologist to keep the latter point in mind when he is confronted with a small biopsy and to consult with the surgeon before the specimen is exhausted in the block.

The mechanics of the frozen section procedure, as we practice it, have been adopted practically without modifications from the one that Dr. Lauren V. Ackerman instituted many years ago at Barnes Hospital in St. Louis. Some of the features that we have found particularly useful or important deserve a separate comment. We are convinced that the policy of having the pathologist going into the operating room, first to obtain the specimen and then to render a diagnosis, is far preferable to the alternatives of using non-medical personnel or electronic devices for this purpose. By doing this, the pathologist has an opportunity to hear directly from the surgeon about the surgical findings and the problem he has encountered; he can see the lesion and the roentgenograms himself; he can advise the surgeon in some specific situations as to how and where to take the biopsy or even whether to take it or not. Upon completion of the frozen section, he can give the diagnosis to the surgeon directly and establish a dialogue with him regarding the expected behavior of the lesion and the preferred method of therapy.

We have found that writing the frozen section diagnosis, *exactly as it was verbally rendered to the surgeon,* in an appropriate Hospital form (a copy of which is added immediately to the patient's chart) is an advisable policy on several counts. It provides a permanent record for medical and legal purposes; it protects the pathologist from possible misunderstandings at the time of the verbal communication with the surgeon; and it provides an easily retrievable format for periodic evaluations of the procedure.

A two-persons team seems to provide the best possible combination in terms of diagnostic accuracy, speed and practicality. While one man cuts the specimen and stains the slide, the other quickly reviews the clinical chart for important clinical data, previous pathology reports and the like; once the slide is ready for examination the two combine whatever knowledge, experience, common sense and courage they might have in the attempt to arrive at the best possible diagnosis.

A side benefit of the frozen section procedure (which, in contrast to the others, also applied to those that are not fully justified) derives from the fact that this is one of the few occasions that a busy pathologist has to receive a fresh specimen immediately after excision. It behooves him to determine on the basis of his own frozen section diagnosis, how to proceed with the remainder of the specimen: imprints, fixation for electron microscopy or immunochemical procedures, sterile sampling for tissue culture and freezing for biochemical determinations are some of the procedures that are done at that very moment (if the pathologist is alert enough to think about them) or not done at all.

References

1. Dockerty MB: Rapid frozen sections—technique of their preparation and staining. Surg Gynec Obstet 97:113, 1953.
2. MacCarthy WC: The diagnostic reliability of frozen sections. Amer J Pathol 5:377, 1929.
3. Ackerman LV and Rosai J: Surgical Pathology, 5th edition, St. Louis, The C. V. Mosby Co., p. 570-571, 1974.
4. Ackerman LV and Ramirez GA: The indications for and limitations of frozen section diagnosis. A review of 1269 consecutive frozen section diagnoses. Brit J Surg 46:336, 1959.
5. Winship T and Resvoll RV: Frozen sections. An evaluation of 1,810 cases. Surgery 45:462, 1959.
6. Ackerman LV and Rosai J: The pathology of tumors, part three. Frozen section, gross and microscopic examination, ancillary studies. CA 21:270, 1971.
7. Nakazawa H, Rosen P, Lane N and Lattes R: Frozen section experience in 3000 cases. Accuracy, limitations, and value in residency training. Amer J Clin Pathol 49:41, 1968.
8. Holaday WJ and Assor D: Ten thousand consecutive frozen sections. A retrospective study focusing on accuracy and quality control. Amer J Clin Pathol 61:769, 1974.
9. Saltzstein SL and Nahum AM: Frozen section diagnoses: accuracy and errors; uses and abuses. Laryngoscope 83:1128, 1973.
10. Stout AP: Frozen section diagnosis in surgery. Surg Clin North Am 36:335, 1956.
11. Horn RC Jr: What can be expected of the surgical pathologist from frozen section examinations. Surg Clin North Am 42:443, 1962.

Continuing Education

Minnesota Radiological Society

Winter Meeting—Minnesota Radiological Society, February 5, 1977. Sheraton-Ritz Hotel, Minneapolis, MN. 3rd Annual K. W. Stenstrom Memorial Lecture, David E. Kuhl, M.D., Director-Nuclear Medicine, University of California at Los Angeles. "The Present and Future of Transmission and Emission C.T. Scanning."

Eventration of Diaphragm

HARRY B. NEEL, M.D.* and LEWIS HANSON, M.D.

Eventration of the diaphragm is a condition in which one leaf of the intact diaphragm is abnormally high. It may be congenital or acquired. Respiratory and gastro-intestinal symptoms may be incapacitating and surgical repair of the diaphragm may be indicated. The case reported is of a man, age 48 years, who had dyspnea on exertion and abdominal distress after eating. Treatment consisted of excision of a portion of the left leaf of the diaphragm and imbrication of the remaining segments.

An abnormally high position of one leaf of the intact diaphragm is referred to as eventration of the diaphragm. This is a rare congenital abnormality which results from a failure of muscularization of the diaphragm and in which the diaphragm becomes a thin membrane which may rise in the chest to the level of the second rib.

Acquired eventration of the diaphragm is caused by injury to the phrenic nerve with resultant paralysis and elevation of the entire diaphragm. This may be secondary to birth trauma or to injury sustained during intrathoracic surgery. Acquired eventration has some characteristics which distinguish it from congenital eventration. The rarity of the condition is attested by the fact that the roentgenograms of the chest of 412,000 subjects showed only 32 cases.[13]

Cruveilhier[1] credits Petit with having first described this condition in 1774. In his subject at autopsy, the diaphragm on the left side was distended and formed a high-lying, flask-shaped pouch. Isolated cases were reported thereafter in 1913 by Bergman[11] (thirty-one cases), and, according to Clopton,[2] eight cases were reported prior to 1899; only 41 cases up to 1919. He added two children, ages 14 months and six years, who had eventration of the diaphragm, with severe symptoms, who were treated successfully without operation. He recognized the rarity of the condition and stated that it is not an operable deformity.

Paris et al[4] (1973) saw nine cases, all infants, in a six year period. In each case thoracotomy was done and the diaphragm plicated. Wayne et al[3] (1974) saw sixty-nine children with eventration in a twenty year period and said that the condition is found in children of all ages.

In some cases eventration is asymptomatic. Those with respiratory symptoms may have dyspnea on exertion, cyanosis and shortness of breath, especially when reclining after meals. Fatigability, recurrent pneumonias and feeding difficulties occur in children. Gastro-intestinal symptoms are indigestion, bloating and heartburn. Volvulus and perforation of the stomach have been reported and produce more severe and acute symptoms. Some patients have not been able to eat and have become weak and emaciated.

In addition to elevation of the diaphragm, radiographic examination may show diminished excursion or immobility of the diaphragm, the stomach in a high position, possibly inverted and with the characteristic inverted fishhook appearance, or it may be rotated so that the greater curvature is uppermost under the elevated dome of the diaphragm. These findings have led to the term "upside down stomach".

It has been suggested that some neonates who die suddenly may have eventration of the diaphragm with resulting compression of the lung, respiratory failure and shift of mediastinum. The incidence may be greater than is suspected and can be determined only by routine chest x-ray of all neonates.

Asymptomatic cases of eventration require no treatment and Wayne et al[3] think that nearly all

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*Albert Lea, Minnesota.

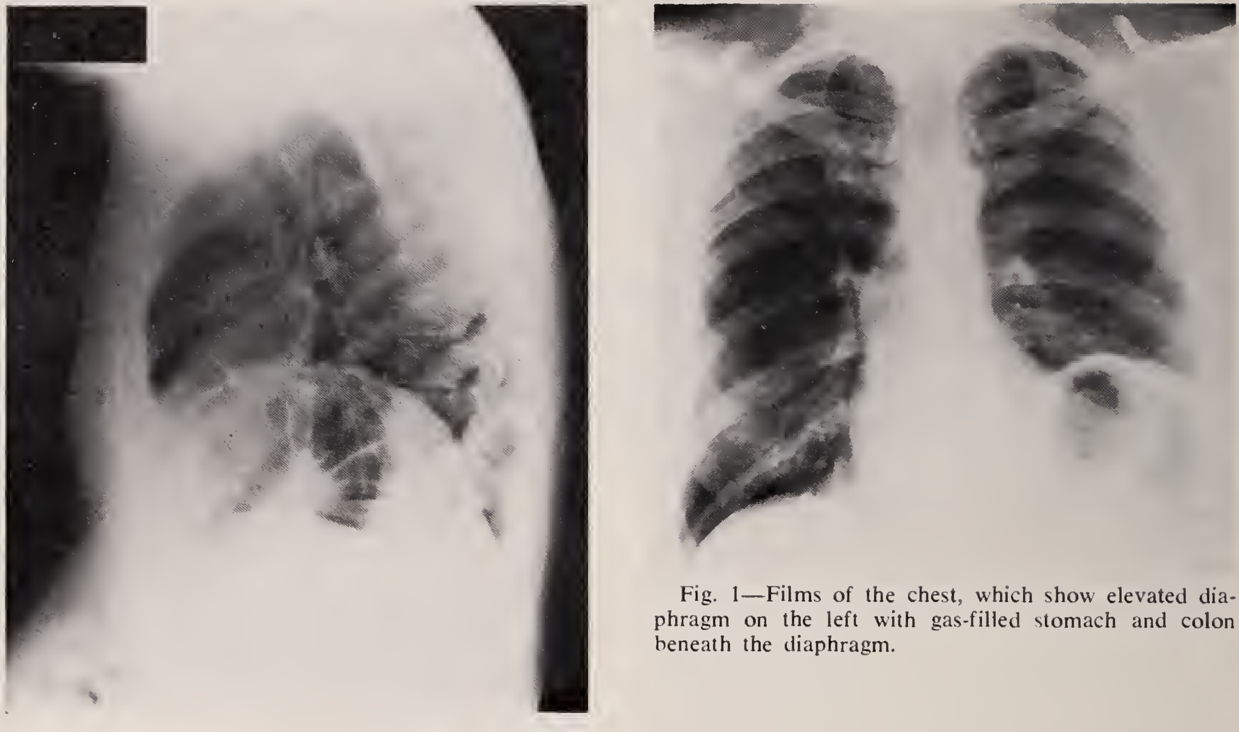

Fig. 1—Films of the chest, which show elevated diaphragm on the left with gas-filled stomach and colon beneath the diaphragm.

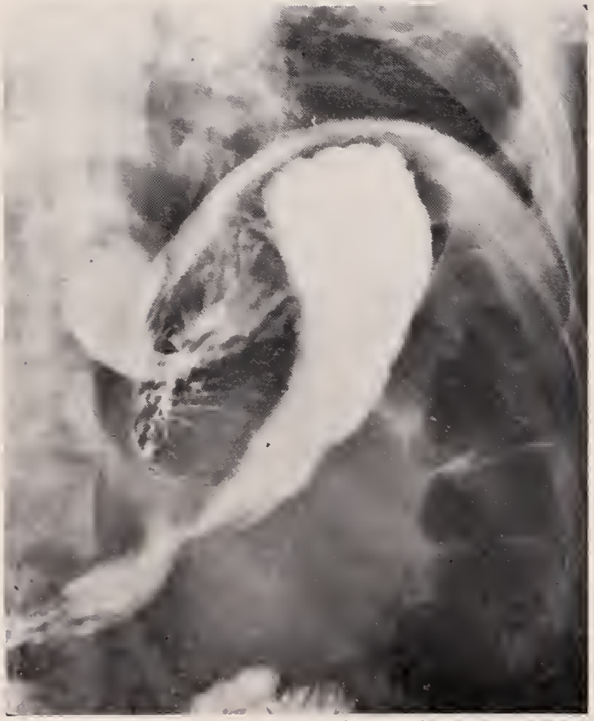

Fig. 2—Film made preoperative during fluoroscopic examination of the upper gastro-intestinal tract. Fundus of stomach is lower than body of stomach and emptying was delayed.

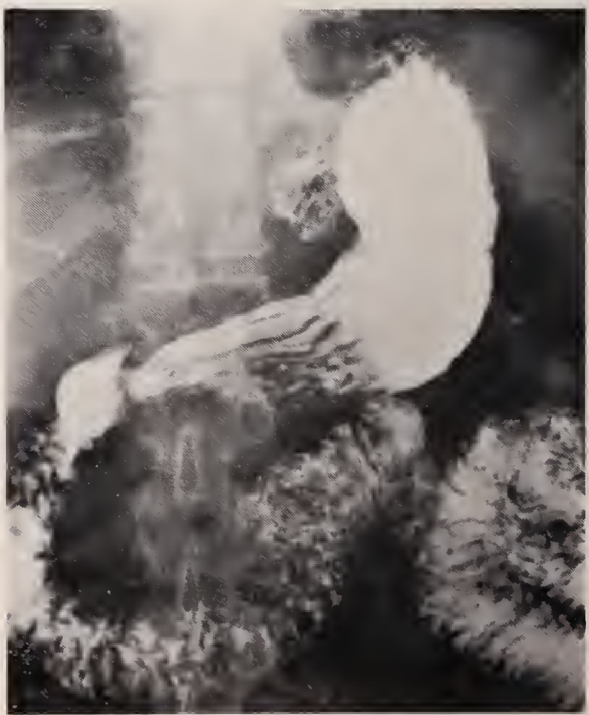

Fig. 3—Xray of barium-filled stomach following correction of eventration of diaphragm.

cases of acquired eventration can be successfully treated without operation. Bisgard[5] did the first operation on an infant, age six weeks, who had respiratory difficulty, cyanosis and difficulty eating. Operation consisted of plication of the diaphragm through the chest and the patient fully recovered. Of twelve neonates with eventration of the diaphragm Stauffer and Rickham[6] operated on eight and they recommend that operative treatment should be undertaken promptly in symptomatic patients.

McNamara et al.,[7] whose thirty-six patients had an average age of 48 years, did a surgical repair in thirteen.

Evans and Simpson[8] saw eight cases of eventration in thirteen years. Their ages ranged from two to 58 years. The left diaphragm was involved in all; there was diminished excursion of the diaphragm in six cases and the diaphragm was immobile in two cases.

Diagnosis and Treatment

It may be difficult to distinguish between diaphragmatic hernia and eventration.[8] Shah-Mirany, Schutz and Watson[9] operated on a 57-year-old white man who complained of incapacitating post-prandial epigastric distress, retrosternal pain, eructation and progressive dyspnea which suggested diaphragmatic hernia. At operation eventration was found, and the attenuated central portion of the diaphragm was excised and the diaphragm was repaired in two layers.

Felix Hughes[10] operated upon a soldier who was thought to have diaphragmatic hernia but who was found to have eventration. At operation the diaphragm was cut and overlapped as in the Mayo operation for umbilical hernia.

Budhraja and Perianayagam[12] reported a case of eventration in an emaciated forty-three year old male who gave a history of recurrent upper abdominal pain of a year's duration. Radiographic examination showed an "upturned stomach" with the greater curvature below the dome of the diaphragm. At operation this patient was found to have an "organo-axial" type of volvulus. Operation consisted of reduction of the volvulus, plication of the dome of the diaphragm and fixation of the posterior wall of the stomach to the jejunum.

Case Report

A white man, age 48 years, was first seen in April, 1975. He complained of shortness of breath, dyspnea

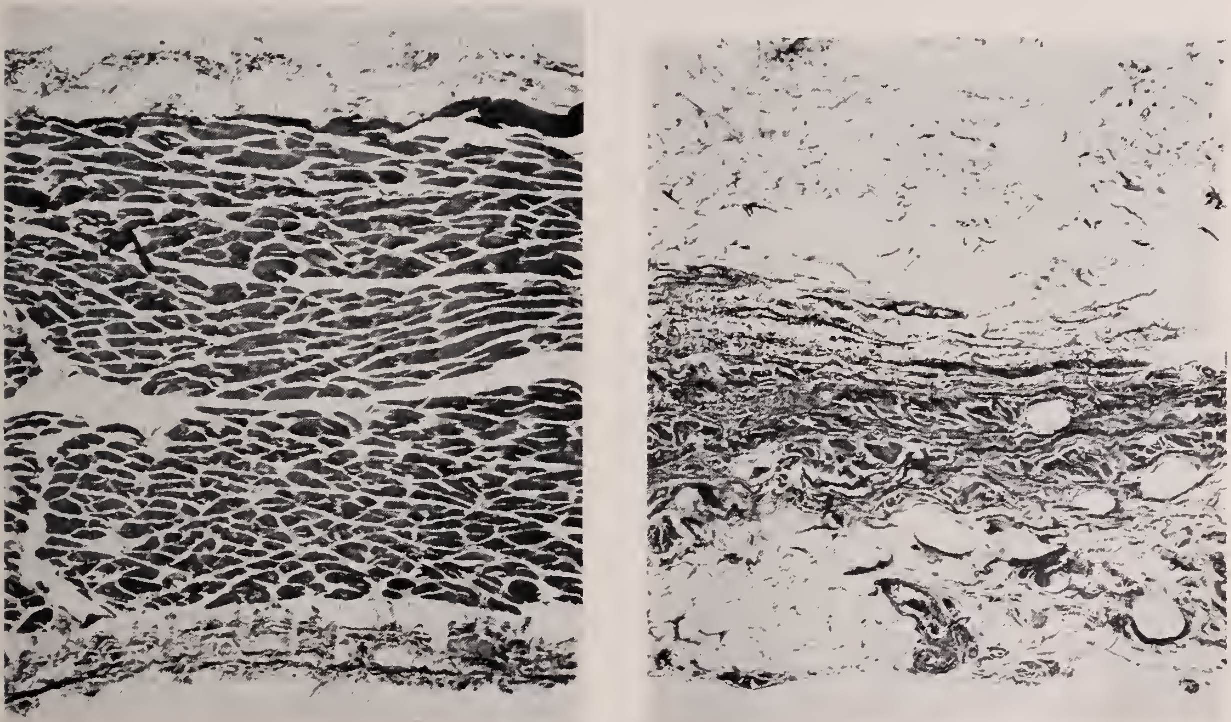

Fig. 4—Photomicrographs (x 64) of normal (left) diaphragm and of the atrophic (right) diaphragm which resulted in eventration.

on exertion, abdominal distress after eating, and he had much gas, fullness and bloating. These symptoms had progressed and patient considered himself totally incapacitated.

His past health had been good though he had had poliomyelitis while stationed in the Army in Korea in 1946. He convalesced in an Army hospital for about a year and thereafter was active as a farmer and was not aware of disability.

This patient was 6′½″ in height and he weighed 215 lbs. His heart sounds were normal and his blood pressure was 120/80 mm. of mercury. The breath sounds on the right were clear. On the left side, the breath sounds were diminished in intensity and could not be heard at the left base. The abdomen was large, round, symmetrical and there was no tenderness.

Radiographic examination of the chest showed that the left hemidiaphragm was markedly elevated, apparently pushed up by considerable air in the stomach and in the splenic flexure of the colon (Figure 1). An upper gastro-intestinal study revealed a stomach that was "cascade" in shape in that the fundus was lower than the body of the stomach so that a special manipulation was necessary to direct the barium from the fundus into the remainder of the stomach (Figure 2).

On April 24, 1975, the left chest was entered through a posterolateral thoracotomy incision. The left leaf of the diaphragm was greatly elevated and thin and without tone. The lower lobe of the lung was partially compressed. An incision was made in the thin diaphragm from near the esophagus to the chest wall. The spleen, stomach and colon were directly beneath this elevated membrane and they were returned to the abdominal cavity proper. A large ellipse of diaphragm was excised and the remaining segments of the diaphragm were then imbricated with two rows of interrupted mattress sutures of heavy silk. This created a firm and satisfactory and nearly flat barrier between the abdomen and the chest. After the chest tube was removed, it was necessary to aspirate fluid from the chest on several occasions; otherwise convalescence was uneventful.

The excised segment of diaphragm was described as thin membranous-appearing tissue which measured 14 x 5 cm. Microscopically, sections showed almost complete loss of muscle fibers and a few small, scattered infiltrations of lymphocytes about the blood vessels (Figure 4).

In August, 1975, the patient reported that he had made a satisfactory recovery and that he was working. He was not dyspneic and his appetite was good. He did have some indigestion for which he occasionally took an antacid but he had gained weight.

References

1. Cruveilhier: Quoted by Clopton. Traite d'anatomie pathologique, tome; p. 617, 1849.
2. Clopton MB: Eventration of the diaphragm. Ann Surg 78:154, 1923.
3. Wayne ER, Campbell JB, Burrington JD, Davis WS: Eventration of the diaphragm. J Pediatr Surg 9:5:643, October 1974.
4. Paris F, Blasco E, Cant OA, Tarazona V, Casillas M. Diaphragmatic eventration in infants, Thorax 28:1:66, January 1973.
5. Bisgard JD: Congenital eventration of the diaphragm. J Thor Surg 16:484, 1947.
6. Stauffer UG, Rickham PP: Acquired eventration in the newborn. J Pediatr Surg 7:6:635, December 1972.
7. McNamara JJ, Paulson DL, Urschel HC, Razzuk MA: Eventration of diaphragm. Surg 64:10-13-1021, 1968.
8. Evans CJ, Simpson JA: Fifty-seven cases of diaphragmatic hernia and eventration. Thorax 5:343, 1950.
9. Shah-Mirany J, Schutz GL, Watson RR: Eventration of the diaphragm, physiologic and surgical significance. Arch Surg 96:844, May 1968.
10. Hughes F: Discussion of Paper by Bisgard.[5]
11. Bergman: Quoted by Bisgard.
12. Budhraja SN, Perianayagam WP: Hypoplasia of left lobe of liver with eventration of diaphragm complicated by volvulus of stomach, report of a case. Ind J Med Sci: 27:11:861, November 1973.
13. Chin EF, Lynn RB: Surgery of eventration of the diaphragm. J Thorc Surg 32:6, 1956.

MINNESOTA MEDICINE

The Board of Editors of Minnesota Medicine invites the members of the Minnesota State Medical Association to submit examples of their art work for publication on the cover of Minnesota Medicine. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of Minnesota Medicine, 101 East 5th St., Suite 900, St. Paul, Minnesota 55101.

Farrell Stiegler, M.D.
Cover Editor

Neonatal Seizures

Quality of Survival

STEPHEN J. BOROS, M.D.* and JANET NYSTROM, R.N., M.Ed.*

Thirty-eight infants who experienced convulsions during the first three weeks of life were re-examined as part of a longitudinal follow-up study. This report examines possible etiologic factors and subsequent follow-up data. Neonatal convulsions, regardless of their etiology, were associated with a 40% incidence of developmental abnormalities, a 42% incidence of neurological deficits, and a 32% incidence of subsequent seizures.

THE PROGNOSTIC SIGNIFICANCE of neonatal seizures is controversial. We followed 38 infants who experienced neonatal seizures and survived to an age where their neurological and developmental status could be satisfactorily assessed. The results of these follow-up assessments form the basis of this report.

Patients and Methods

The study group consisted of 38 infants who experienced frank seizures during the first three weeks of life and survived. Seizures were either —*tonic convulsions,* characterized by extension of the trunk and lower limbs or—*clonic convulsions,* consisting of repetitive jerking movements which could not be stopped by flexing the effected extremity. Clonic seizures were focal, multifocal and generalized. "Jittery" infants, whose tremors could be stopped by flexing extremities, and infants experiencing only periodic apnea and/or bradycardia were not included.

All patients were transferred to Children's Hospital from community hospitals within a 100 mile radius of the city of St. Paul. Each had blood glucose, calcium, electrolytes, and hemoglobin measured at the time of admission. Infants requiring intravenous fluids received 60-70 ml/kg/day of 10% dextrose in water for the first day, and thereafter, 80-100 ml/kg/day of 10% dextrose in a multiple electrolyte solution. Those with umbilical vein or artery catheters received at least 400 mg. of calcium gluconate/100 cc. of I.V. fluid infused.

Following the first seizure, serum electrolytes, glucose, calcium, and magnesium were measured. A lumbar puncture was performed and CSF glucose and protein determinations, cell counts, gram stains, and cultures were performed. Blood and urine cultures were also obtained. Subsequent evaluations of most patients included skull Xrays, an electroencephalogram, and examination by a pediatric neurologist.

Patients were re-examined at six months of age, one year, and at yearly intervals thereafter. Follow-up evaluations consisted of complete physical and neurological examinations and a Denver Developmental Screening Test (DDST). DDSTs were scored "normal," "questionable," or "abnormal," using the criteria of Frankenburg et al.[1] All patients with abnormal neurological examinations were followed in conjunction with a pediatric neurologist.

Results

Table 1 classifies seizures according to their probable etiologies and outlines significant neonatal and follow-up data.

Perinatal Asphyxia

Seventeen patients (45%) had convulsions associated with perinatal asphyxia. Asphyxia was defined as an Apgar score of four or less at one or five minutes. The clinical details of those infants in this, the largest etiologic category, are outlined in Table 2. Birth weights ranged from 1250 grams to 4536 grams with a mean weight of 3222 grams. Gestational ages ranged from 31

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*Children's Hospital, St. Paul, Minnesota, and the Department of Pediatrics, University of Minnesota, Minneapolis, Minnesota.

TABLE 1
Neonatal Seizures: Etiologic Factors and Follow-Up Data

Etiology	Neonatal Data							
			Birth Weight (gm)		Gestational Age (wks)		Age (yr)	
	No.	%	Mean ± 1 SD	Range	Mean ± 1 SD	Range	Mean	Range
Perinatal Asphyxia	17	(45%)	3222 ± 886	(1250-4536)	39 ± 3	31-42	1.7	(1-4)
Unknown Etiology	8	(21%)	3202 ± 762	(1900-4370)	40 ± 3	34-43	2.3	(1-4)
Postnatal Shock	5	(13%)	2215 ± 1079	(1248-4000)	35 ± 3	32-40	2.6	(1.4)
Hypoglycemia	4	(10%)	3322 ± 842	(2230-4061)	39 ± 1.5	37-40	1.5	(1-2)
Meningitis	3	(8%)	2684	(1400-3572)	35	30-40	1.7	(1-3)
Hypernatremia	1	(3%)	3700		40		1	
TOTAL	38		2971 ± 1002	(1250-4370)	38 ± 3	30-43	1.9	(1-4)

Etiology	Follow-Up Data							
			DDST		Neurological Deficits		Seizures	
	No.	%	Abnormal %	Questionable %	No.	%	No.	%
Perinatal Asphyxia	17	(45%)	9 (53%)	0	9	(53%)	8	(47%)
Unknown Etiology	8	(21%)	2 (25%)	0	3	(38%)	1	(12%)
Postnatal Shock	5	(13%)	0	1 (20%)	1	(20%)	0	
Hypoglycemia	4	(10%)	3 (75%)	0	3	(75%)	3	(75%)
Meningitis	3	(8%)	0	0	0		0	
Hypernatremia	1	(3%)	0		0		0	
TOTAL	38		14 (37%)	1 (3%)	16	(42%)	12	(32%)

TABLE 2
Clinical Features of Seizures Associated With Perinatal Asphyxia

						Follow-Up			
Patient	Weight (gm)	Gestational Age (wks)	Primary OB Problem	MCHC-Labor Index Score	Fetal Monitor	Age (yr)	DDST	Neuro Exam	Subsequent Seizures
1	1250	31	Bleeding	165		1	Normal	Normal	
2	2381	36	Diabetes, Toxemia, dead twin	100*		1	Normal	Normal	
3	2427	41	Prolonged labor, pitocin, IUGR	115*		1	Normal	Normal	
4	2449	35	Bleeding	135*		1	Normal	Normal	
5	2500	36	Rh Incompatibility	130*		1	Abnormal	Abnormal	+
6	2613	40	Dead twin	145*		1	Abnormal	Abnormal	+
7	2900	38	Bleeding, fetal bradycardia	140*		1	Abnormal	Abnormal	+
8	3350	40	Contracted pelvis, toxemia	125*	+	2	Abnormal	Abnormal	+
9	3400	40	Anemia, prolapsed cord	130*	+	2	Abnormal	Abnormal	+
10	3400	40	Fetal bradycardia	165		1	Abnormal	Abnormal	+
11	3414	42	Meconium stained fluid	145*		1	Abnormal	Abnormal	+
12	3550	40	Prolonged labor	180		1	Abnormal	Abnormal	+
13	3685	40	Diabetes	100*		4	Normal	Normal	
14	4118	41	Prolonged labor	180		1	Normal	Normal	
15	4366	40	Young primigravida, shoulder dystocia	145*		4	Abnormal	Abnormal	
16	4431	40	Diabetes	170		3	Normal	Normal	
17	4536	40	Breech	165		2	Normal	Normal	

*High risk.

to 42 weeks, the mean being 39 weeks. A retrospective analysis of these pregnancies using the Combined Maternal-Child Health Care and Labor Index (MCHC-L) of Aubry and Pennington demonstrates that 11 of the 17 infants (65%) were products of "high-risk" pregnancies (MCHC-L scores of <150).[2] Electronic fetal heart rate-uterine contraction monitoring was used in two. At follow-up examination, one to four years later, nine children (53%) had abnormal DDSTs; nine (53%) had abnormal neurological examinations; and eight (47%) experienced subsequent seizures.

Etiology Unknown

Eight patients (21%) experienced convulsions whose etiology, despite intensive laboratory evaluations, could not be determined. These infants ranged in weight from 1900 grams to 4370 grams with a mean weight of 3202 grams, and in gestational age from 34 to 43 weeks (mean 40 weeks). Two of these children (25%) had abnormal follow-up DDSTs. Three (38%) exhibited neurological defects and one (12%) experienced subsequent seizures. One child, who continued to have seizures, was blind and later found to have ketotic hypoglycemia. A second child with an abnormal neurological examination (mild right-sided hemiparesis) had a porencephalic cyst discovered at one year of age.

Postnatal Shock

Five patients (13%) experienced seizures in association with postnatal shock. Two were associated with necrotizing enterocolitis, one with severe hyaline membrane disease and a consumptive coagulopathy, one with pulmonary hemorrhage, and one patient was admitted at one week of age following a cardio-respiratory arrest associated with the aspiration of a milk feeding. Four of the five patients had normal follow-up developmental examinations. One patient had a very mild spastic diplegia. No patient in this group experienced subsequent seizures.

Hypoglycemia

Four patients (10%), whose birth weights ranged from 2230 grams to 4061 grams and gestational ages from 37-40 weeks, experienced seizures in association with hypoglycemia. Hypoglycemia was defined as a blood sugar of 20 mg% or less in infants less than 37 weeks gestation and 30 mg% or less in term infants. Only one of these four infants had a normal DDST. Neurological deficits were noted in three of the four. All three infants had subsequent convulsions.

Meningitis and Hypernatremia

Three patients (8%) experienced seizures in conjunction with bacterial meningitis. All were normal at follow-up examination. One patient convulsed in association with severe hypernatremia (serum sodium 195, serum osmolarity 547). This infant was also completely normal at the time of her one year follow-up examination.

Discussion

Seizures during the neonatal period may not be strictly tonic or clonic. Neonatal convulsions may be subtle and transient, may be associated with apnea and bradycardia, perhaps even jitteriness. We chose to examine only those infants who experienced unequivocal seizures. For this reason, our series is small and any conclusions drawn from it must be drawn carefully. Despite these limitations, several observations can be made.

First, hypocalcemia was conspicuously absent from our list of seizure etiologies. This is unusual since most observers report that 13-36% of neonatal seizures are due to hypocalcemia.[3,4] We can only speculate that in critically ill infants, those predisposed to early hypocalcemia, routine administration of calcium gluconate with intravenous fluids and the scrupulous monitoring of serum calcium may prevent levels from falling into the range that would precipitate a convulsion. The fact that infants with seizures caused by late hypocalcemia (secondary to the calcium-phosphorous imbalance of prepared formulas) are rarely admitted to neonatal intensive care units may explain the absence of this entity from our series.

Second, seizures of unknown etiology appear to have a fairly good prognosis providing no overt cause, such as a structural malformation, later becomes apparent. This is consistent with the experience of others.[3] The encouraging follow-up data of those few infants who convulsed during postnatal shock states appears to justify a vigorous therapeutic approach to such neonatal catastrophies.

Third, and most importantly, perinatal asphyxia was by far the most common cause of neonatal convulsions. Birth asphyxia is one factor that may be predictable, hence, preventable. Sixty-five percent of the infants having seizures associated with perinatal asphyxia were products of "high-risk" pregnancies, yet only two received intrapartum electronic fetal monitoring. Modanlou, Yeh and Hon demonstrated that the high-risk fetus is much more likely to demonstrate acidosis and depression at birth than is the non-high-risk fetus.[5] Shenker, et al., reported a dramatic reduction in the number of intrapartum stillbirths and low Apgar scores following the routine monitoring of all patients in labor.[6] Gabert and Stenchever from the University of Utah noted a drop in perinatal mortality from 29.94 to 18.2 and a 67% reduction in neonatal mortality following the routine monitoring of laboring women.[7] The disastrous consequences of neonatal seizures secondary to perinatal asphyxia underscore the recommendation that all high-risk pregnancies receive the benefit of electronic fetal heart rate monitoring and that there be a liberal utilization of Cesarean section for observed fetal distress.

Generalizations regarding the other seizure categories are difficult to make since their numbers are extremely small. Overall, it has been our experience that seizures are of serious significance during the neonatal period. Convulsions, regardless of their etiology, were associated with a 37% incidence of developmental abnormalities, a 42% incidence of neurological deficits, and a 32% incidence of subsequent seizures.

Acknowledgment

We are grateful to Dr. John W. Reynolds for his advice and review of the manuscript.

References

1. Frankenburg WK, Goldstein AD, Camp BW: The revised Denver Developmental Screening Test: Its accuracy as a screening instrument. J Pediatr 79:988, 1971.
2. Aubry RH, Pennington JC: Identification and evaluation of high-risk pregnancy: The perinatal concept. Clin Obstet Gynec 16:3, 1973.
3. Rose AL, Lombroso CT: Neonatal seizure states: A study of clinical, pathological, and electroencephalographic features in 137 full term babies with a long term follow-up. Pediatrics 45:404, 1970.
4. Hopkins IJ: Seizures in the first week of life: A study of aetiological factors. Med J Aust 2:647, 1972.
5. Modanlou H, Yeh S, Hon EG: Fetal and neonatal acid-base balance in normal and high-risk pregnancies. Obstet Gynecol 43:347, 1974.
6. Shenker L, Post R, Seiler J: Routine electronic monitoring of fetal heart rate and uterine activity during labor. Obstet Gynecol 46:185, 1975.
7. Gabert H, Stenchever M: Continuous electronic monitoring of fetal heart rate during labor. Amer J Obstet Gynecol 115:919, 1973.

Cover Photograph

"Late Winter Storms"

February storms occasionally push up huge mounds of ice on the North Shore of Lake Superior. Waves striking against the shore ice add to the accretion. The ice jam photographed on the cover extended out 150 feet from the shore. It was photographed at Reservation River on March 6, 1976 while Dr. Robert Benjamin was cross country skiing along the North Shore. A Minolta SRT 101 Camera with a 55 mm Rokkar 1.7 lens was used.

Dr. Benjamin is a surgeon with the St. Louis Park Medical Center. Besides photography, his hobbies include cross country skiing, snowshoeing, and canoeing.

Heat Stroke

Associated with Medications Having Anticholinergic Effects

BRUCE E. ADAMS, M.D.*†; ANTHONY S. MANOGUERRA, Pharm.D.*;
G. PATRICK LILJA, M.D.*; ROBERT S. LONG, M.D.* and ERNEST RUIZ, M.D.*

HEAT STROKE IS A well known summertime hazard that results when the body loses its normal heat regulating mechanisms. Clinically the victim has a very high body temperature and dry skin devoid of perspiration. Tachycardia, mental disorientation or coma are also characteristic. If the body temperature is not lowered promptly hypotension, seizures, stroke symptoms, renal failure and death may ensue.

Usually the heat stroke victim has a pre-existing cardiovascular disorder or was performing strenuous physical activity in a hot, humid environment. Patients taking medications with anticholinergic effects have also been shown to be susceptible to heat stroke. Drugs shown to produce this susceptibility include antiparkinsonian agents, antihistamines, antipsychotic agents, antidepressants, and antispasmodics.[2,7,8]

During the month of July 1974, eleven cases of heat stroke were resuscitated and hospitalized at Hennepin County Medical Center (Table). In eight of these cases, the patient was taking a medication with anticholinergic properties. Two cases terminated fatally.

Case Reports

Case #1

A 77-year-old female with a diagnosis of chronic undifferentiated schizophrenia was brought to the emergency department from a nursing home on July 8, 1974. Her medications at this time included thioridazine 25 mg three times a day and benztropine mesylate 1 mg twice a day. The patient had fallen out of bed and was found obtunded. On arrival she had a rectal temperature of 107°F. She was obtunded with hot, dry skin devoid of perspiration. She was placed on a cooling blanket and ice water soaks were begun with rapid restoration of her body temperature to normal within one hour. As her temperature returned to normal she became more alert and oriented. It was learned that the day prior to admission she had a temperature of 104.7° rectally which did not respond to aspirin administration. Other sources of fever were ruled out by culture and the patient made an uneventful recovery. She was discharged to the nursing home three days after admission without medications.

Case #2

A 74-year-old male nursing home patient was found wandering outdoors wearing a heavy winter overcoat on July 13, 1974. He had been previously diagnosed as having chronic schizophrenia and chronic brain syndrome secondary to chronic alcoholism. His medications included chlorpromazine 50 mg three times a day, haloperidol 4 mg at bedtime and benztropine 2 mg at bedtime. Upon arrival in the Emergency Department, the patient was alert but agitated. His temperature was 104°F orally and his skin was hot and dry. His temperature was lowered with the use of a cooling blanket and ice water soaks and his agitation cleared. He was discharged to his nursing home two days after admission.

This patient had also been admitted to Hennepin County Medical Center in 1972 and 1973 for heat stroke while taking the same medications.

Case #3

A 63-year-old nursing home patient was brought to the Emergency Department on July 8, 1974 when it was noticed that he had an elevated temperature and was agitated. The patient had previously been diagnosed as having a manic depressive psychosis and compensated congestive heart failure. His medications included haloperidol 4 mg at bedtime, benztropine 2 mg at bedtime, hydrochlorothiazide 25 mg twice a day, digoxin 0.375 mg daily and potassium chloride 15 mEq three times a day. In the Emergency Department he was extremely agitated with a temperature of 107°F rectally. His skin was hot and dry. A cooling blanket and iced water soaks were ineffective in lowering his temperature and he was placed in a bathtub of cold water and ice cubes. In 30 minutes his temperature was 99°F orally and he was less combative and more oriented. A chest Xray taken the next day revealed a right lower lobe pneumonia which was felt to be secondary to aspiration. The patient was given ampicillin orally and was afebrile throughout his hospital stay of seven days. He was discharged to his nursing home and was placed on the

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†Now at Ripple River Medical Center, Aitkin, Minnesota.

TABLE

Patient	Rectal Temp	Ambient Temp	Medications	Pre-existing Medical Problems	Outcome
F-age 77	107	96	Benztropine mesylate 1 mg bid; thioridazine 25 mg tid	Chronic undiff schizophrenia	Discharged to nursing home in 3 days with no medications
M-age 69	104+	101	Benztropine mesylate 2 mg h.s.; trifluoperazine 2 mg tid	Chronic schizophrenia	Discharged in six days on same medications
M-age 74	104	89	Chlorpromazine 50 mg tid, haloperidol 4 mg h.s., benztropine mesylate 2 mg h.s.	Chronic organic brain syndrome, chronic schizophrenia, chronic alcoholism	Discharged after two days on same medications
M-age 64	107	96	Benztropine mesylate 2 mg h.s. haloperidol 4 mg h.s. hydrochlorthiazide 25 mg bid potassium chloride 15 mEq tid digoxin 0.375 qd	Manic depressive psychosis, congestive heart failure	Discharged after seven days on same medications
	106	92	Same as above	Same as above	Discharged after four days on same medications
M-age 58	108	92	Thioridazine 35 mg q.d., amitriptyline 25 mg tid, diphehydramine 25 mg q.d.	Chronic alcoholism chronic brain syndrome	Discharged in five days with same medications
M-age 68	107	99	None	Adult onset diabetes mellitus, chr. alcoholism, massive obesity.	Pulmonary embolus after seven days uneventful recovery
M-age 48	108.2	90	Over the counter sleeping medications	Chronic alcoholism	Uneventful recovery
F-age 77	107	92	None	Fractured humerus	Died eight days later of staphylococcal sepsis.
M-age 74	105.5	101	Ampicillin 250 mg qid	Chronic lung disease, peripheral vascular disease	Died one day after admission
M-age 68	108	90	Benztropine 1 mg h.s., methyldopa 250 mg bid, potassium chloride 15 mEq tid, nortriptyline 50 mg tid, perphenazine 4 mg bid, dioctyl sodium sulfo-succinate, 100 mg h.s., hydrochlorthiazide 50 mg bid	Manic depressive psychosis; hypertension	Discharged after four days with same medications
M-age 65	106.2	91	Haloperidol 10 mg qd, benztropine mesylate 2 mg h.s.	Schizophrenia	Discharged after four days with same medications

same medications.

Two days after discharge the patient fell to the sidewalk and became disoriented. He was brought to the Emergency Department with a temperature of 106°F rectally and with hot, dry skin. He was placed in a tub of ice water and in one hour his temperature was normal and he was oriented. He was discharged to his nursing home in five days with no complications. All cultures of blood, sputum, cerebrospinal fluid and urine were negative.

Case #4

A 58-year-old white male with chronic brain syndrome secondary to alcoholism was brought to the Emergency Department after collapsing on the street. His medications included thioridazine 35 mg daily, amitriptyline 25 mg three times a day and diphenhydramine 25 mg daily. In the Emergency Department he had a temperature of 108°F rectally, a pulse of 150, blood pressure of 180/90 and hot, dry skin. He was obtunded and shortly after arrival had two focal right sided seizures. A cooling blanket and iced saline soaks failed to lower his temperature. A gastric tube was placed and his stomach was lavaged with iced saline. Forty-five minutes later his temperature was 102.4°F rectally and he was transferred to the medical intensive care unit. He was discharged five days later with no complications. Cultures of blood, sputum, urine and cerebrospinal fluid were all negative.

Case #5

This 74-year-old male was brought to the Emergency Department after being found unresponsive in bed with a temperature of "108°." He had been diagnosed as having chronic obstructive pulmonary disease and cardiovascular and peripheral vascular disease. Several years previously he had undergone aorto-iliac surgery for occlusive disease. The only medication he was on was ampicillin 250 mg four times a day. In the Emergency Department his temperature was 105.5°F rectally, blood pressure was 60/0 and pulse was 160. Shortly after arrival he suffered a major motor seizure. Treatment with iced soaks and a cooling blanket was started and his stomach was lavaged with iced saline. Two hours later his temperature was 99°F rectally and he was transferred to the medical intensive care unit. Despite vigorous continued therapy the patient expired 20 hours after admission. Multiple cultures were all negative. Autopsy findings were consistent with the diagnosis of heat stroke as the cause of death.

Discussion

The cases presented illustrate the significant incidence of morbidity and mortality associated with heat stroke. Mortality figures as high as 70 percent have been reported and heat stroke is said to kill 4000 or more Americans each summer.[3] Of particular interest is the fact that the majority of the cases that we treated were taking medications with anticholinergic properties. Considering the large number of elderly patients who are taking these medications, this places a significant number of individuals at risk for developing heat stroke during periods of increased ambient temperatures.

Interference with thermoregulation can occur with a number of commonly prescribed drugs. These include anticholinergic drugs (atropine, scopolamine, propantheline, etc.), antiparkinsonian drugs with atropine-like activity (benztropine, trihexyphenidyl, etc.), phenothiazine tranquilizers (chlorpromazine, thioridazine, etc.), tricyclic antidepressants (imipramine, amitriptyline, etc.), butyrophenone tranquilizers (haloperidol, droperidol) and antihistamines (chlorpheniramine, diphenhydramine, etc.). All of these drugs have potent atropine-like activity. Other drugs which inhibit thermoregulation by a different mechanism are the sympathomimetic drugs with strong alpha adrenergic activity (epinephrine, levarterenol, ephedrine, etc.).

In man, sweat gland excretion is controlled by two major factors, cholinergic nerve stimulation of the gland and cutaneous blood flow. Drugs with anticholinergic activity block the nervous stimuli for sweat gland excretion and may contribute to the induction of heat stroke in patients exposed to elevated environmental temperatures.[2,6,8,11] It appears that inhibition of sweating occurs with lower doses of anticholinergic drugs than does the frequently seen side effect of dry mouth or blurred vision.[8] The sympathomimetic drugs, which produce peripheral and cutaneous vasoconstriction, decrease blood flow to sweat glands. The decrease in blood flow decreases the ability of the gland to excrete water.[5]

The third mechanism by which drugs may interfere with thermoregulation is by the disruption of hypothalamic controls. The phenothiazines and the butyrophenones depress the hypothalamus and disrupt the thermoregulatory mechanisms leading to poikilothermy.[4] The contribution that these drugs make to the induction of heat stroke is a combination of this effect and their potent anticholinergic effect. In many instances these drugs are prescribed in combination with a potent anticholinergic drug such as benztropine to counteract any extrapyramidal side effects induced by the tranquilizer. This combination is particularly effective in inhibiting thermal control mechanisms.

All the drugs discussed so far induce heat stroke when the external environmental temperature is elevated. In contrast, the tricyclic antidepressant drugs when combined with either a monoamine oxidase inhibitor or a phenothiazine have produced severe or fatal hyperthermia in the absence of any environmental predisposing factors.[1,7,9,10]

Most suggestions for prevention of heat stroke in elderly patients include: adequate fluid and salt intake, limiting exposure to direct sunlight, limiting physical exertion, frequent sponge baths and assurance of adequate ventilation and circulation of air with fans or air conditioners. We wish to add to this list and emphasize the need to avoid drugs with anticholinergic properties during periods of increased ambient temperature as they may precipitate or complicate heat stroke.

In the emergency management of these patients it is often impractical and dangerous to use the widely recommended procedure of placing the patient in a tub of ice water. These patients often have cardiovascular disease and may suffer a fatal arrythmia under these circumstances. An alternative is iced saline gastric lavage with precautions to prevent aspiration. This method can be used while the patient is being monitored and can proceed even if external cardiac massage has to be administered. The obtunded patient, of course, should have a cuffed endotracheal tube inserted prior to gastric intubation. Our experience is consistent with the teaching that iced water sponge baths and cooling blankets alone are often not effective in rapidly cooling these patients.

References

1. Bowen LW: Fatal hyperpyrexia with antidepressant drugs. Brit Med J 2:1465, 1964 (Letter).
2. Chapman J: Iatrogenic heat stroke. JAMA 161:1375, 1956.
3. Clowes GHA and O'Donnell TF: Current concepts: Heat stroke. New Eng J Med 291:564, 1974.
4. Goodman LS and Gilman A: The pharmacological basis of therapeutics, 4th edition, MacMillan Co., New York, pp 151-170, 1970.
5. Houdas H: Skin temperatures in warm environments and the control of sweat evaporation. J Appl Physiol 33:99, 1972.
6. Jewett SP, Rosow HM and Pumpain-Mindlin E: High dosage atropine therapy in chronic encephalitic Parkinsonism. Amer J Med Sci 195:809, 1938.
7. Lewis, Edmund: Hyperpyrexia and antidepressant drugs. Brit Med J 1:1671, 1672, 1965 (Letter).
8. Litman RE: Heat sensitivity due to autonomic drugs. JAMA, 149:635, 1952.
9. Lockett MF and Milner G: Combining the antidepressant drugs. Brit Med J 1:921, 1965 (Letter).
10. Stanley B and Pal NR: Fatal hyperpyrexia with phenelzine and imipramine. Brit Med J 2:1011, 1964 (Letter).
11. Wilcox WH: The nature, prevention and treatment of heat hyperpyrexia. Brit Med J 1:392, 1920.

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Gerontology

Role of Medical Director in a Nursing Home

J. J. PATTEE, M.D.*

A NURSING HOME medical director must relate to the administrator, the personnel of the home, the residents, the medical community and the entire community. This paper will describe concepts to aid administrators and medical directors in getting physicians involved in nursing homes.

Nursing Homes and Life Management

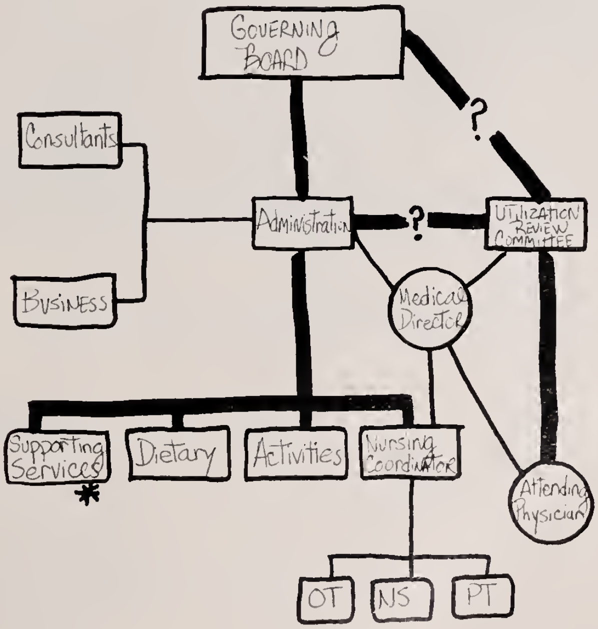
Nursing homes vary in size and personality. However, they all have the common mission of managing the lives of their residents. The hospital trained and oriented medical professions may look at nursing homes as health management facilities. But there is an important distinction between hospital management and life management. Managing a person's life, of course, is a much broader concept and includes social and psychological aspects, all important to a good life.

How does a nursing home accomplish this mission? The traditional in line management of a nursing home is presented in the Figure. Usually the directors of the various departments are responsible to the administrator, who in turn is responsible to the governing board. The medical director usually will function without disturbing this line of responsibility and accountability. Before developing the role of the medical director, the roles of the administrator and department heads will be clearly defined and understood.

We physicians are well prepared for our role in the nursing department. However, we need exposure to concepts of personnel management, business administration, sociological observations and psychology (goals, motivation, behavior modification, incurable disease, aging and death) as it relates to nursing home personnel and residents. This is all available to us in appropriate journals and post graduate seminars.

Relationship to Administrator

First, the medical director must develop a comfortable relationship with the administrator. The administrator will accept the fiscal responsibility for the home and he will look to us to provide reasonable solutions to medical problems consistent with good medical care. The physician will offer the administrator an avenue to develop rapport with the medical profession and medical facilities in the community. His knowledge of physicians' interest and integrity will help in developing a workable utilization review committee and a group of responsible attending physicians.



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*Maintenance, laundry, purchasing and housekeeping.

Figure—In-line management organization.

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*Diplomate, American Board of Family Practice; Assistant Professor, Director of Gerontology, Dept. of Family Practice, University of Minnesota and Fellow of the American College of Nursing Home Administrators, Minneapolis, Minnesota.

Relationship to Employees

Through the administrator the medical director will have a relationship to each employee. Physical exams prior to employment may need his interpretation. Personnel health policies need the medical director's ideas. He can encourage personal growth of all employees through inservice programs and establish a means of providing social or psychological consulting for those who need it (A.A., Alanon, mental health clinics, etc.).

Physicians and Nurses

The nursing service may expect the medical director to help develop emergency procedures, nursing routines and patient care policies. The excellence of a nursing home can be judged by the quality of inservice. The whole spectrum of educational opportunities are enhanced by the contacts we physicians have in the community. Nurses are often the best trained persons available to a nursing home resident in an acute emergency. The medical director can encourage and support the expansion of the nurses' role. Committee meetings, such as infection control and pharmacy committee, will benefit from the medical director's presence and input. The nursing service will expect the director's support of patient care conferences that involve all departments, as well as interested relatives and the resident. These conferences give an integrated approach to the resident.

Interest in Nursing Home Environment

The medical director's interest in the nursing home environment, diets and social activities does much to help these employees identify as part of the resident's life management. Positive feedback is particularly effective in maintaining employee morale, especially if expressed by a physician. These employees have limited background and need to identify their activities with the physical and psychological well being of the residents.

In the medical director's role the physician need have little direct contact with the patients. Accepting a reasonable share of patients as the primary physician will give balance to the medical staff and reduce demands on the director. A medical director who is the primary physician for most or all of the residents in a nursing home may find it difficult to obtain support in the medical community.

Relationship with Other Physicians

The medical director's presence in the medical community makes the home known to other physicians. Casual conversations with peers may prevent confrontations that harm the nursing home—medical community relationship. I see the medical director as a tactful public relations man. Accountability of attending physicians is best a function of the utilization review committee.

Representing the Home in the Community

Finally, the medical director can represent the nursing home in the community. This person has a responsibility to integrate the nursing home into the activities of the community by encouraging volunteers, relatives and organizations to identify with the nursing home residents.

References

1. Frank Kenneth D: Government Support of Nursing Home Care. New Engl J Med 287:11, September 1972.
2. Gladue J: Evolution of the medical director concept. J Amer Geriat Soc, 22:43, 1974.
3. Shaughnessy M: The role of the medical director in the nursing home. J Amer Geriat Soc 21:569, 1973.
4. Solon & Greenawalt: Physicians' participation in nursing homes. Medical Care 12:6, June 1974.
5. Meyer Derril D: The role of the medical director. Nursing Homes, June 1973.
6. Kleh Jack: Better patient care, role of medical director. ACNHA, 1:11, Spring 1973.
7. Committee on Aging, Council on Medical Service, American Medical Association, "Guidelines for a Medical Director in a Long-Term Care Facility," PB 863J 1/74: 4M.

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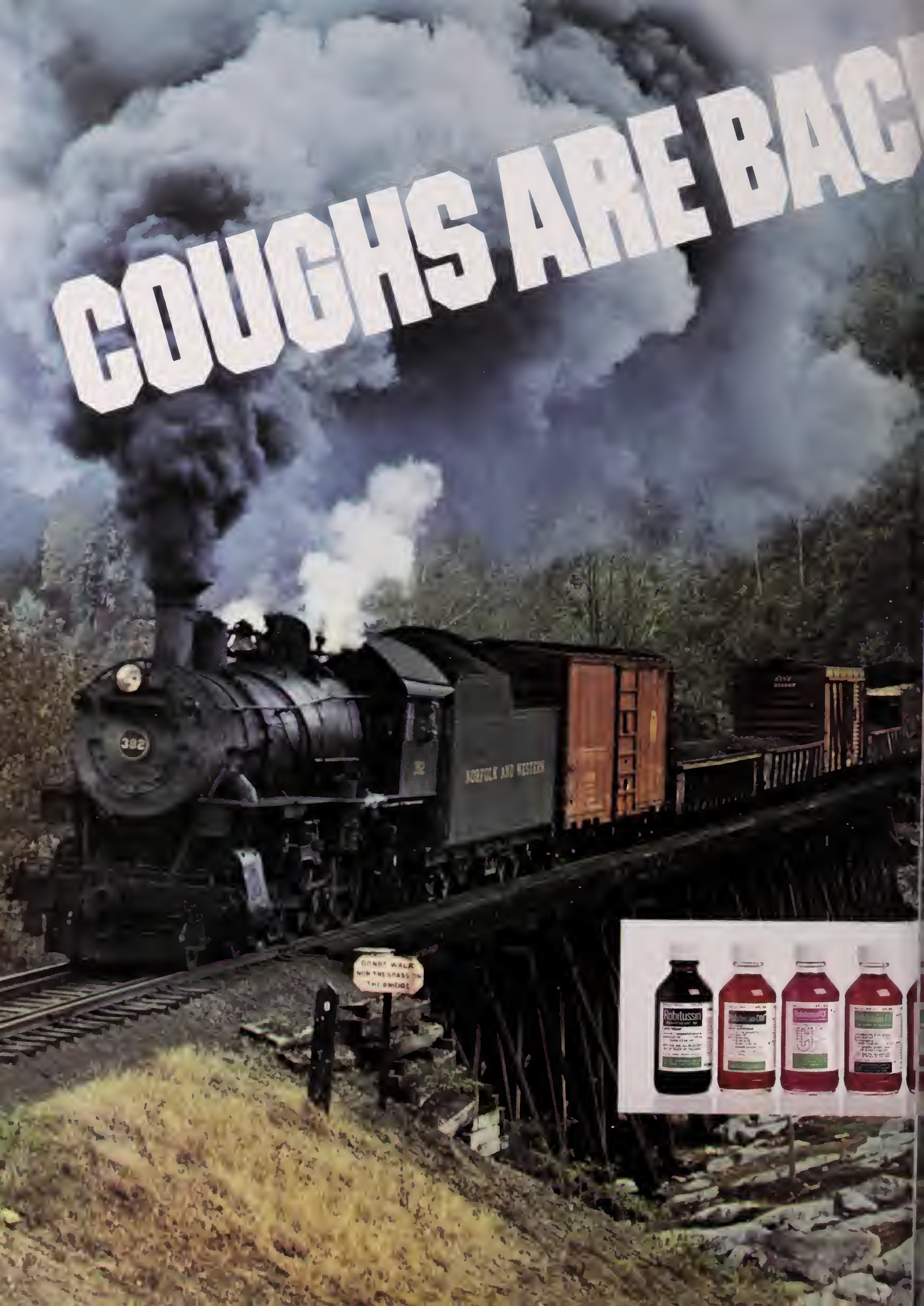
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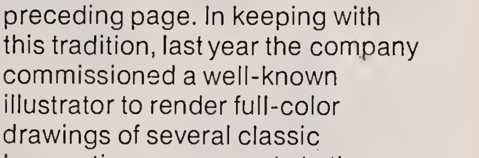

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Letter to the Editor

Hepatitis-B Infection in An Institution for the Mentally Retarded

Dear Editor:

In his interesting comments[*] to our report on Hepatitis-B surface antigen (HB$_s$-Ag) among mentally retarded residents of the Faribault State Hospital,[†] Dr. C. A. Pierach raises the question of a possibly *high* persistent HB$_s$-Antigen carrier rate among institutional staff. Reports in the literature and our own investigations do not support such contention.

In the years 1970-75, the Minnesota Department of Health tested 516 "new" and about 400 "old" employees of the Faribault State Hospital for HB$_s$-antigen using the counter-electrophoresis (C.E.P.) method. Among the 516 new employees tested at the time of their employment one was found positive. This represents 0.19 percent and falls within the accepted HB$_s$-Ag carrier rate of 0.1 to 0.25 percent in the general population of the U.S.A. Seven percent of these employees volunteered to be retested after one year and were found again negative.

In 1971, 233 "old" employees of all types of occupation, but mainly Health Care staff (nurses, aids, physicians, dentists and laboratory personnel) were found negative, including about a dozen with a history of viral hepatitis in the past. Only one 58 year old dormitory supervisor in perfect health and with a negative history of hepatitis, showed a *transitory* carrier state which cleared up within ten weeks.

In addition, 167 Health Care staff (H.C. staff) in an occupation which entailed a high risk of exposure, were closely followed by testing every four to six months for several years: 11 members of the clinical laboratory and Xray staff; 140 H.C. staff of four dormitories with a carrier rate between 25 and 35 percent among the residents, and 16 H.C. staff in daily close contact with a 16 year old chronic HB$_s$-Ag carrier with cerebral palsy and excessive salivation; they wore gloves for self-protection taking care of him.

None of these 167 H.C. Staff members were found ever to have or to develop a persistent HB$_s$-Ag carrier state including seven who developed a clinical Hepatitis-B and became HB$_s$-Ag negative within eight to sixteen weeks concomitant with clinical and biochemical recovery. In two of these cases, HB$_s$-Ag was detected—by chance—four weeks prior to the clinical onset. All these seven people remained HB$_s$-Ag negative.

Recently we were able to reconfirm these results on about 50 H.C. staff members of two dormitories, the clinical laboratory and the Dental Department, using the Reversed Passive Hemagglutination (Aus-cell) method. Only one of them was found positive.

While most investigations found an almost complete absence of an HB$_s$-Ag carrier state among H.C. staff of large institutions for the retarded,[1-7] two studies[4,7] reported an HB$_s$-Ag carrier rate of 3.4 percent and 1.8 percent respectively, the latter prevalence based on the more sensitive method of Radio-Immuno-Assay (R.I.A.). These rates are still 5 to 10 times lower than the carrier rates found among the institutionalized mentally retarded.

The cause for such a vast difference in the HB$_s$-Ag carrier rates between H.C. staff and residents of the same institution has to be sought in differences in the degree of exposure, the mode of the non-parenteral transmission, the dose of the inoculum and foremost the individual ability of antibody response.

Recent studies of HB$_s$-Ag and Anti-HB$_s$ prevalences[4-7] using the more sensitive methods of Passive Hemagglutination and Radio-Immunoprecipitation, seem to indicate that for the H.C. staff the *exposure* to the HB$_s$-virus (estimated as the cumulative rates of HB$_s$-Ag and Anti-HB$_s$ prevalences) is only about a third of that for the residents. About 6 percent of H.C. staff become Anti-HB$_s$ positive during the first year of employment.[7] In the average 20 to 30 percent, in highly infected dormitories 40 percent of them show traceable HB$_s$-antibodies. This enables them to terminate any HB$_s$-Antigenemia.

These few observations, coupled with the ob-

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[*] May issue, page 315.
[†] April issue, page 263.

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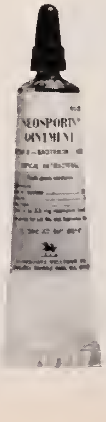
Complete literature available on request from Professional Services Dept. PML.



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servance of good personal hygiene such as scrupulous handwashing techniques and wearing gloves in certain high risk situations (e.g. laboratory or dental work on known HB_s-Ag carriers) should be reassuring to all H.C. personnel in Mental Retardation Institutions. The development of a specific Hepatitis-B Hyperimmune Serum Globulin should relieve the situation greatly.

Clarification of the many immunological, epidemiological and clinical problems in the Hepatitis-B puzzle have to be expected when the methods of determination of the subtypes of HB_s-Ag, of the Hepatitis-B Core antigen (HB_c-Ag) and of the e-antigen and anti-e system become more readily available.

H. H. Bruhl, M.D.
Faribault, Minnesota

References

1. Sutnick A, London WT, Gerstley BJ et al. Anicteric hepatitis associated with Australian antigen. JAMA 205:670, 1968.
2. Krugman S & Giles JP:Viral hepatitis: new light on an old disease. JAMA 212:1010, 1970.
3. Chance E: Prevalence of hepatitis associated antigen (HAA) in an institution for the mentally retarded. Am J Ment Def 77:1, 1972.
4. Szmuness W, Prince AM, Etling GF & Pick R: Development and distribution of hemagglutinating antibody against the hepatitis B, antigen in institutionalized populations. J Inf Dis 126:498, 1972.
5. Tevaluoto-Aarnio M. Epidemiology of hepatitis-B antigenemia in an institution for mentally retarded. Scand J Infect Dis 6:309, 1974.
6. Madden DL, Dietzman DE et al. Epidemiology of Hepatitis-B virus in an institution for mentally retarded persons. Am J Ment Def 80:369, 1976.
7. Moti L Tiku, Beutner KR et al. Hepatitis-B infection in health care personnel of an institution for mentally handicapped children and adults. J Clin Microbiol 3:469, 1976.

Hepatitis-B Infection

Dear Editor:

It is helpful and reassuring to read Dr. Bruhl's above Letter to the Editor pointing out that hepatitis B surface antigen (HB_s-Ag) carriers are not common among employees in his and other institutions. This obviously speaks highly for the meticulous cleanliness observed by the employees.

Careful examination, occasionally even including a liver biopsy, seems to be necessary for HB_s-Ag carriers as recently pointed out[1] where four blood donors who were positive for HB_s-Ag were found to have "the full histologic spectrum of chronic hepatitis despite minimal symptoms."

C. A. Pierach, M.D.
Minneapolis, Minnesota

Reference

1. Sampliner R: Chronic active hepatitis in hepatitis B surface antigen (HB_s Ag) carriers, J A M A 237:50, 1977.

C.M.E. Membership Requirement

Don't forget to report your CME credits for 1974-76 by February 28th. Your MSMA membership depends on it!

LETTER TO THE EDITOR

Yesterday
our husbands practiced medicine in a free and independent way.
Today
they practice with restrictions and liability pressures.
Tomorrow
they may practice with total government control.

Dear Editor:

This is the Rx we have been trying to tell this year. As physicians' wives, we are concerned about the welfare of medicine and we need help in telling the "health care story" as it really is. Yes, it is important to physicians that their wives belong to the National and State Auxiliary. Is she prepared to refute the unfavorable criticism of the medical profession? Does your community know where she stands? Does she know how to influence public opinion as well as legislation favorable to medicine? Where would she get the information and expertise to present a united front to critics of medicine? From the National and State Auxiliary, of course, through our publications and letters sent throughout the year.

If a physician lives in an area where there is an unorganized auxiliary, his wife could belong by being a member-at-large. The dues would be ten dollars ($10)—seven dollars ($7) for National and three dollars ($3) for our State dues. His wife would receive from National—MD's Wife and Direct Line; and from our State Office the Gopher Doctor's Wife and other communications about meetings and workshops. The dues should be sent by March 31st to our State Treasurer—Mrs. Robert Woodburn whose address is 1220 Ingerson Court, St. Paul 55112.

If a physician lives where there is an organized county auxiliary, we encourage his wife to join by paying her dues to the County Treasurer. The dues would be ten dollars ($10) plus whatever the County Auxiliary dues are. We encourage wives to join—we need their moral and financial support.

As a Medical Society member, you realize the need for a "unified front." Auxiliary, the "right" arm of the Medical Society, provides that, plus more—the opportunity to be informed on today's problems of professional liability, legislation, and the free practice of private medicine.

Mrs. Clyde Culp
President
Minnesota State Medical Association Auxiliary

Malpractice Woes

Dear Editor:

Following is a timely anecdote in light of today's malpractice woes.

"While ordinary care is all that is required, there must be extraordinary vigilance to make sure that this degree of care is always reached. If you use such care in the light of the advancing knowledge of the profession you will have little to fear from malpractice suits." (Would That It Were So)*

T. Rumsey, M.D.
St. Paul Minnesota

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*From Fractures and Malpractice Suits by C. L. Young Esq. The J Lancet, March 1, pp. 132-141, 1918.

Special Article

Approaching the Problem of Sudden Infant Death Syndrome

RALPH A. FRANCIOSI, M.D.*

SUDDEN INFANT DEATH Syndrome (SIDS) or crib death is the leading cause of infant death after the first week of life. Any program directed to SIDS should have social and scientific goals. The social goals include identification of SIDS cases, emotional support of the SIDS family, and education about SIDS. The scientific goals are detection of cause(s) and prevention.

Any efforts directed towards SIDS will have far reaching implications regarding infant death. These efforts will stimulate insight into the physiology of infancy and produce an understanding of grief and mourning in families experiencing infant death. In 1975 there were 55,581 deaths in infants less than one year of age. This accounted for 2.8% of the total deaths in the United States. The causes listed were: anoxia, 26%; anomalies, 16%; immaturity, 10%; hyaline membrane disease, 9%; pneumonia, 6%; and accidents, 2%. In the broad category of anoxia cases of SIDS would be classified.

Medical progress is exposing causes of infant death which are not easily understood or treated. Disappearing are deaths due to disease which can be treated by antibiotics or prevented by vaccines. Persisting are problems related to newborns, birth defects and accidents. The leading cause of infant death is SIDS and although the death is related to anoxia, the cause or causes are not well understood.

The epidemiological data available show that 90% of SIDS cases occur before six months of age and 99% below one year of age. Almost every case is associated with a sleep period. Approximately two-thirds of SIDS cases have had some abnormality in the perinatal period, e.g., prematurity. An upper respiratory infection is present in 40-50% of cases.

Theories that are presently tenable implicate hypoxia during sleep as the final pathway in SIDS. It is suggested that this hypoxia may have several causes, one being brain stem lesions and another obstruction of the upper airway. The first implies that lesions can compromise involuntary centers for respiration and cardiovascular control in the brain stem. The latter suggests that in young infants the upper airway is critical to oxygen intake and may be compromised, e.g., viscid secretions.

Concept of Minnesota SIDS Program

The approach to SIDS in Minnesota is based upon a cooperative effort of existing resources that relate to SIDS cases (Figure). The coordination of these resources implies, first, an educational effort about SIDS to the various groups and then development of a system based upon a coordination of these resources. The use of consultants will be restricted to areas of education or other areas in which there is a severe deficit of resources.

Role of SIDS Center

The Sudden Infant Death Center has the role of coordinating the Minnesota SIDS Program through a coordinator and a secretary. The Center maintains communication with the various resources listed in the Figure. Following identification of the SIDS case, the case is referred to the Center. After notification the Center informs the appropriate public health nursing agency in the county where the SIDS case occurred. The public health nurses establish contact with the family and hopefully arrange a home visit. The nurse can assess the necessity for further counseling of the parents, siblings or other family members. A request for counseling can be directed to the coordinator at the Center who informs the mental health consultant. The consultant can then speak to the nurse and assess the situation and obtain the appropriate mental health input, preferably

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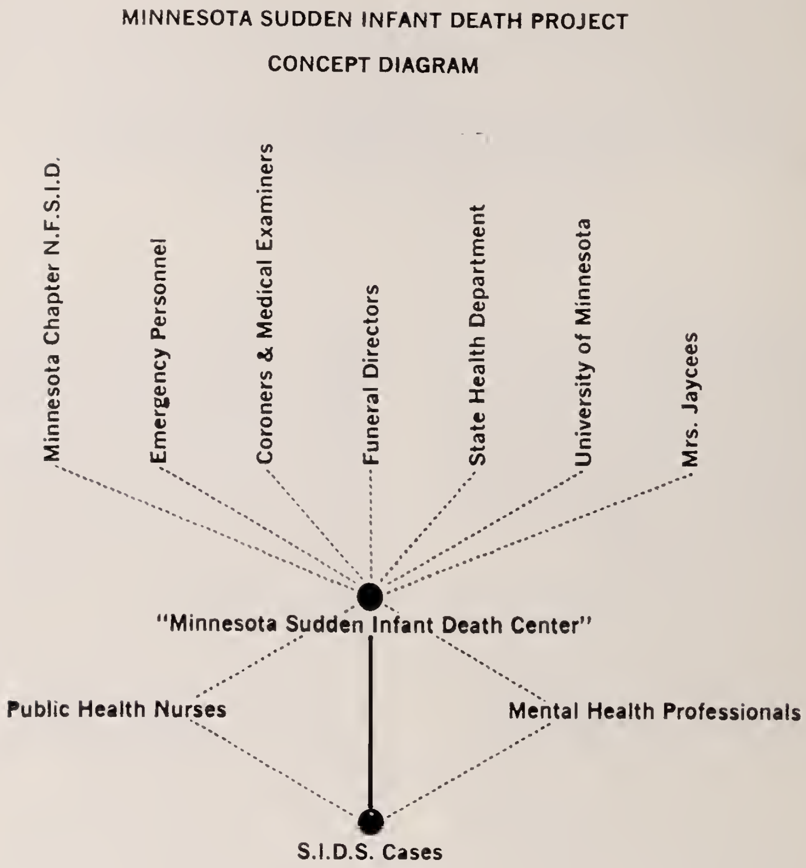
*Project Director of Minnesota Sudden Infant Death Syndrome Program and Director of Laboratories at Children's Health Center, Minneapolis.



MINNESOTA SUDDEN INFANT DEATH PROJECT

CONCEPT DIAGRAM

Minnesota Chapter N.F.S.I.D.
Emergency Personnel
Coroners & Medical Examiners
Funeral Directors
State Health Department
University of Minnesota
Mrs. Jaycees
"Minnesota Sudden Infant Death Center"
Public Health Nurses
Mental Health Professionals
S.I.D.S. Cases

Figure

within the community of occurrence.

The Center will work closely with the Maternal and Child Health Section of the State Health Department to educate about SIDS. The initial educational effort would be to public health nursing agencies in Minnesota. The mental health aspects of SIDS will be stressed so that the nurses can utilize this training during their contact with SIDS families. In addition, an educational program will be directed at medical and nonmedical professionals.

Identification of SIDS Case

The responsibility of explaining an unexpected death falls upon coroners and medical examiners as defined by states in their death investigation laws. Since SIDS cases cannot be identified without a complete autopsy, this forms the basis of identification. Following identification, notification of the SIDS Center allows the remainder of the program to operate.

Counseling SIDS Families

The tragedy of SIDS affects both parents and siblings. Parents react with a feeling that error in omission or commission caused death. This feeling is compounded by any contacts after the death which reinforce their guilt. Hopefully, under the SIDS Program educational efforts directed to emergency personnel responding at the scene, e.g., policemen, firemen, paramedics, emergency personnel in hospitals, funeral directors, coroners and medical examiners, would lessen the likelihood that guilt would be compounded. The referral of a family to the SIDS Center by one of the above mentioned groups will allow the intervention of public health nurses and consultants in mental health. The effect of death on siblings is dependent upon their level of maturity. Young children below the age of five years view death as a separation and reversible. Children five to nine years old view death as an event that is not final and under their control. Children above the age of nine years realize that death is an irreversible phenomenon and that it can happen to them. There is also the realization in adolescents that death is usually associated with severe illness or old age but can occur at all ages. An awareness that Sudden Infant Death Syndrome does affect siblings allows parents to address this problem.

Role of Minnesota Chapter of NFSIDS

The Minnesota Chapter of the National Foundation of Sudden Infant Death Syndrome is one of 43 parent chapters in the United States. These parents, who have experienced Sudden Infant Death Syndrome, are willing to reach out and help others. The chapter maintains a mailing address and phone number which is similar to the Minnesota Sudden Infant Death Center. The chapter, however, is a separate entity and has officers who handle chapter business. In addition, the chapter is responsible for maintaining area contacts in various parts of Minnesota to provide support for new SIDS parents, as well as educating the public about the effect of SIDS upon parents and siblings.

Role of Volunteer Groups

Selection by the Mrs. Jaycees of Minnesota of SIDS as a two-year commitment beginning June 1, 1976, is an example of volunteer input. The Mrs. Jaycees have 215 chapters throughout the state of Minnesota. These chapters are integrated into districts and then into a state organization. Their primary role is involvement in community activities. The Mrs. Jaycees have a state chairwoman, Mrs. Pam Reinert, who is responsible for coordinating the SIDS effort in Minnesota. The initial phase of the project is an educational awareness among chapter members of the social impact of SIDS. The second phase will be an indepth educational effort directed towards various community groups involved in the management of SIDS cases, e.g., police, firemen, nurses, physicians, coroners, medical examiners, funeral directors and clergy.

The Minnesota Association of Funeral Directors is conducting an educational campaign to alert funeral directors to the problem of SIDS. Once this is accomplished, indepth seminars will be held at the School of Mortuary Science, University of Minnesota, to address the role of funeral directors in acute grief counseling. Mr. Phillip Iacavino, the Executive Director of the Minnesota Funeral Directors' Association, and Dr. Robert Slater, the Professor and Chairman of the Department of Mortuary Science at the University of Minnesota, are spearheading this effort.

Summary

The Minnesota Sudden Infant Death Syndrome Program attempts to lessen the social impact of SIDS by focusing on case identification, counseling and education. The program is coordinated at the Sudden Infant Death Center. Through input from various groups involved in Sudden Infant Death Syndrome, e.g., emergency personnel, nurses, physicians, coroners, medical examiners, clergy, funeral directors, and mental health personnel, the coordinator can assist the family during this crisis. The assistance consists of public health nurse visits, counseling by mental health personnel, and alerting community resources, e.g., clergy.

The Minnesota State Board of Medical Examiners

Notice of Suspension

Donald William Hannon, M.D.
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See next page for brief summary.

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Tedral SA: *Adults*—One tablet on arising and one tablet 12 hours later. Tablets should not be chewed. *Children*—Not established for children under 12.

Tedral Elixir: Note: One teaspoonful is equivalent to *one-quarter* Tedral tablet. *Children*—One teaspoonful per 30 lb body weight, every 4-6 hours, unless prescribed otherwise by physician. Should be given to children under 2 years of age only with extreme caution. *Adults*—One to two tablespoonfuls every four hours.

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Screening of a High-Risk Ambulatory Female Population for Urinary Tract Infection

A Cost-Effectiveness Study

AMOS S. DEINARD, M.D.* and SHERWOOD LIBIT, M.D.*

A dip-slide culture method was compared to microscopic examination of urinary sediment with regard to efficiency and cost of detecting presumptive bacteriuria in an ambulatory female population (1414 cases) attending a Maternity and Family Planning Clinic. 80(5.7%) of the women were shown to have presumptive bacteriuria by this method. 72% of these cases were later confirmed by conventional culture techniques. Urinalysis, alone, would only have detected 16 cases and two cases by the criteria of significant pyuria and hematuria, respectively. Cost analysis revealed that the dip-slide method was approximately 90% less expensive, per case screened, than conventional urinalysis. It is suggested, therefore, that a practical approach for Maternity or Family Planning Clinics would be to eliminate microscopic examination of urinary sediment entirely and, instead, screen all patients by testing a clean-voided specimen with a combination multi-purpose test-strip and dip-slide and then confirming all instances of presumptive bacteriuria with conventional, quantitative urine cultures.

URINARY TRACT INFECTION is an often asymptomatic condition affecting up to 4% of adult women.[1] Such infection represents an unknown risk for the development of clinical pyelonephritis, particularly during pregnancy or in the immediate post-partum period,[2] with eventual renal compromise.[3] Therapy of asymptomatic bacteriuria appears to reduce maternal morbidity during pregnancy[4] without significant influence upon fetal risks.[5]

The presumed high cost of mass screening for bacteriuria by culture has discouraged many physicians from its use as a routine office or clinic procedure. We have attempted to dispel this attitude by comparing, in an ambulatory female population, the cost of detecting bacteriuria by a recently developed dip-slide method and by the traditional method of urinalysis. This study demonstrates the sensitivity and lower cost of the former approach.

Materials and Methods

One thousand-four hundred and fourteen female patients of lower socio-economic status who were attending the Maternity and Family Planning Clinics at the Minneapolis, Minnesota, Public Health Center were screened over an 18-month period. As part of each woman's routine initial evaluation, a clean-voided, mid-stream urine specimen was collected, following proper perineal cleansing, for urinalysis and urine culture. Urine specimens were refrigerated immediately after collection and processed for urinalysis and urine culture within one hour of collection.

Urinalysis included a measurement of pH with litmus paper, assessment of the presence of protein and glucose with Uristix (Ames) and determination of specific gravity with a Urinometer. Microscopic examination was performed under

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*Department of Pediatrics, University of Minnesota Hospitals and the Bureau of Maternal and Child Health, Minneapolis Health Department, Minneapolis, Minnesota and the Department of Pediatrics, University of Chicago, Chicago, Illinois.

Address for reprint requests: Amos S. Deinard, M.D., Associate Professor, Department of Pediatrics, Box 60, University of Minnesota Hospitals, Minneapolis, Minnesota 55455.

high-dry magnification (430x) on the urine sediment from 10 ml. of centrifuged urine.

A urine culture was performed using a dip-slide* (Figure). This device consists of a polystyrene plate coated on each side with a different culture medium; for this study, trypticase soy agar (TSA) and eosin methylene blue agar (EMB) were the media employed. The dip-plate was emersed in the urine, drained and then incubated for 18 hours at 37°C, enclosed in its container. Quantitation was done by comparing colony density on each medium surface to photographs of standardized inocula that are supplied by the manufacturer.

CULTURIA
10^3
10^4
10^5
10^6
10^7
CULTURIA T.S. AGAR
CULTURIA

Figure—Inoculated dip-slide, photographs of standardized inoculum and incubation container.

All dip-slide cultures that contained 10^4 col./ml. or more of a single isolate were subsequently confirmed following reinstruction of the patient in the technique of collecting a clean-voided, midstream specimen. This confirmatory culture and all additional follow-up cultures were performed according to a streak-plate method.[6] The confirmatory culture was used to make specific identification of an organism and to conduct appropriate antibiotic sensitivity tests.

The data were analyzed from the standpoint of cost-effectiveness of each method's documentation of presumptive bacteriuria. Cost always reflected the expense of materials and labor needed to complete each procedure.

Results

Since gram-negative organisms are the usual pathogens in cases of uncomplicated bacteriuria, the important consideration for a detection program is the extent to which such organisms will grow on a selective medium (EMB). When 1414 women were screened by the dip-slide method (Table 1), 80 individuals (5.7%) were considered to have presumptive bacteriuria, i.e., 10^4 col./ml. or more of a single gram-negative organism. As far as the growth of organisms on TSA medium was concerned, it was usually the case that a mixed growth was noted when the bacterial count on the EMB medium was less than 10^4 col./ml., often the case that a mixed growth was noted when the bacterial count on the EMB medium was 10^{4-5} col./ml. but only rarely the case that

TABLE 1
Comparison of Growth on Trypticase Soy Agar (TSA) and Eosin Methylene Blue Agar (EMB) Using a Dip-Slide Method

		TSA (col/ml)		
		$<10^4$	10^{4-5}	$>10^5$
EMB (col/ml)	$<10^4$	900	225	179
	10^{4-5}	1	5	15
	$>10^5$	0	3	56

TABLE 2
Correlation of the Results of a Urinalysis and a Urine Culture (Dip-Slide Method) Performed on the Same Specimen of Urine

	Urinalysis Results*									
	WBC (#/hpf)				RBC (#/hpf)			BACTERIA		
Dip-slide (EMB) Results	occ.	<10	10-20	>20	0	1-2	>2	0	occ.	$\geq 1+$
$<10^4$ col/ml	858	410	44	22	1274	50	10	1278	32	24
10^{4-5} col/ml	15	5	0	1	20	1	0	21	0	0
$>10^5$ col/ml	22	22	5	10	51	6	2	31	9	19

*Casts were never reported.

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*Culturia Bi-Media Dip-Plate (Clinical Convenience Products, Inc., Madison, Wisc.)

a mixed growth was noted when the bacterial count on the EMB medium was greater than 10^5 col./ml.

When the results of the urine cultures are compared to the results of the urinalyses performed on the same specimens of urine (Table 2), it is apparent that few of the 80 cases of presumptive bacteriuria would have been detected by the criteria of pyuria ($\geqq$10 cells/hpf), hematuria ($\geqq$2 cells/hpf) or the presence of bacteria ($\geqq$1 +).

As far as confirmation of these 80 cases of presumptive bacteriuria was concerned, 33 of the patients were lost to follow-up for a variety of reasons so that a confirmatory quantitative urine culture could not be performed. Of the remaining 47 women, significant bacteriuria with organisms typically associated with bacteriuria[7] was confirmed in 34 (72%).

Since cost-effectiveness was the critical consideration, the cost of each of the two screening procedures was computed and compared (Table 3). Screening by dip-slide cost $0.44 per case screened while screening by complete urinalysis cost $0.98 per case screened. When screening costs were analyzed on the basis of cost/case of presumptive bacteriuria detected, the cost was $7.84 for the dip-slide method. For urinalysis, the cost would have been $10.06 if the 137 observed cases (Table 2) of significant pyuria, microscopic hematuria or bacteria were all different cases or $16.81 if there was complete overlap of those cases, so that the 12 instances of significant microscopic hematuria and the 43 instances of significant numbers of bacteria occurred among the 82 instances of significant pyuria. As far as the cost of confirmation is concerned, it makes no difference how presumptive bacteriuria is detected for a standard confirmatory procedure would be used. In our hands, confirmation costs $1.43 per case (Table 4).

Discussion

This study compared the cost-effectiveness of urinalysis, including microscopic assessment of urinary sediment, to that of a dip-slide method of urine culture to screen for presumptive bacteriuria in an ambulatory female population attending a Maternity and Family Planning Clinic. Urinalysis, alone, was insufficiently sensitive to detect bacteriuric individuals, a finding that has been previously noted by others.[8] However, with the dip-slide culture method, 5.7% of the women tested were found to have presumptive bacteriuria, with significant bacteriuria being confirmed in 72% of those patients who made themselves available for confirmatory cultures. That false positives occurred may be attributed either to the different perineal cleansing methods used in this study by the patients, even though a standard approach to perineal cleansing was explained to each woman prior to the collection of the urine specimen,[4] or to the fact that some cases of presumptive bacteriuria cleared spontaneously before the confirmatory culture could be performed.

The dip-slide method was found to be approximately one-half as costly, per case screened, as the urinalysis. However, since the dip-slide method detected presumptive bacteriuria several times more effectively than did any component of the complete urinalysis, relative cost should be weighted to reflect that difference in detection capability. On the basis of our data, it appears to us that the most practical approach for Maternity or Family Planning Clinics would be to eliminate microscopic examination of urinary sediment en-

TABLE 3

Cost-Analysis of Screening for Bacteriuria by a Dip-Slide Method and By Urinalysis

Dip-Slide Method (1414 cases)	
(1) Materials—$0.35/kit	$494.90
(2) Labor to:	
a) Inoculate, label and incubate—30 sec/kit	88.38
b) Read—15 sec/kit	44.19
	$627.47
	($0.44/case screened)
Urinalysis (1414 cases)	
(1) Materials for routine urinalysis, including microscopic examination of urinary sediment	$ 141.40
(2) Labor to perform urinalysis—7 min/specimen	1237.25
	$1378.65
	($0.98/case screened)

TABLE 4

Cost-Analysis of the Confirmation of Presumptive Bacteriuria by a Quantitative Streak-Plate Method (80 cases)

(1) Material and labor to prepare EMB and SBA plates	$ 14.40
(2) Labor:	
a) To streak, label and incubate plates—2 min./specimen	20.00
b) To read plates, prepare slide for Gram staining and read slide—8 min./specimen	80.00
	$114.40
	($1.43/case)

tirely and screen all patients by testing a clean-voided mid-stream urine specimen with a multipurpose test-strip that measures urinary pH and detects the presence of albumin, sugar, ketone bodies and occult blood, and with a dip-slide to detect presumptive bacteriuria. Once presumptive bacteriuria is documented, confirmatory testing should then be done by the conventional, quantitative streak-plate method. The cost, per patient, for this screening approach would be $0.97 (Table 5). Not only is this cost less than the cost, per patient, for a routine complete urinalysis but the approach would be approximately five times more sensitive in detecting cases of bacteriuria.

TABLE 5
Cost-Analysis of a Modified Urine Screening Program (per Patient Screened)

(1) To measure pH and to detect the presence of albumin, glucose, occult blood, ketone bodies & bilirubin	
a) Multi-purpose test strip	$0.15
b) Labor to use test strip and to test specific gravity with Urinometer—3 min.	0.38
(2) To detect presumptive bacteriuria	
a) Material (kit)	0.35
b) Labor to:	
1) Inoculate, label and incubate kit—30 sec.	.06
2) Read kit—15 sec.	.03
	$0.97

Summary

The cost of case-finding for the dip-slide approach is considerably less than the cost/detected case for other routine screening tests.[9,10] This simple, inexpensive dip-slide method of urine culture to detect presumptive bacteriuria has been used by others for population screening.[11-18] However, unlike the present study, those prior studies did not examine the *cost* of population screening, a consideration which is becoming a major factor in contemporary health-care delivery.

Acknowledgments

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References

1. Kass EH: Pyelonephritis and bacteriuria. A major problem in preventive medicine. Ann Intern Med 56:46, 1962.
2. Kincaid-Smith P and Bullen M: Bacteriuria in pregnancy. Lancet 1:395, 1965.
3. Little PJ: The incidence of urinary tract infection in 5000 pregnant women. Lancet II:925, 1966.
4. Norden CW and Kass EH: Bacteriuria of pregnancy—a critical appraisal. Annu Rev Med 19:431, 1968.
5. Gower PE, Haswell B, Sidaway ME and DeWardener HE: Follow-up of 164 patients with bacteriuria of pregnancy. Lancet 1:990, 1968.
6. Hoeprich PD: Culture of the urine. J Lab Clin Med 56:899, 1960.
7. Kunin CM and Halmagyl MS: Urinary tract infections in school children. II. Characterization of invading organisms. N Engl J Med 266:1297, 1962.
8. Kunin CM, Deutscher R and Paquin A Jr: Urinary tract infection in school children: an epidemiologic, clinical and laboratory study. Medicine 43:91, 1964.
9. Collen MF, Kidd PH, Feldman R and Cutler JL: Cost analysis of a multiphasic screening program. N Engl J Med 280:-1043, 1969.
10. Collen MF, Feldman R, Siegelaub AB and Crawford D: Dollar cost per positive test for automated multiphasic screening. N Engl J Med 283:459, 1970.
11. Mackey JP and Sandys GH: Laboratory diagnosis of infections of urinary tract in general pediatrics by means of dip-inoculum transport medium. Brit Med J 2:1286, 1965.
12. Cohen SN and Kass EH: A simple method for quantitative urine culture. N Engl J Med 277:176, 1967.
13. Guttman D and Naylor GRE: Dipslide: An aid in quantitative urine culture in general practice. Brit Med J 3:343, 1967.
14. Arneil GC, McAllister TA and Kay P: Detection of bacteriuria at room temperature. Lancet I:119, 1970.
15. Parkkulainen KV and Kosunen TB: A follow-up study of bacteriuria in female patients treated for recurrent urinary tract infections using dip-slides. Ann Clin Res 3:163, 1971.
16. McDonald PJ, Furness ET and Beasley NV: Dip-slide diagnosis of urinary tract infection. Med J Australia 1:20. 1972.
17. Craig WA and Kunin CM: Quantitative urine culture method using a plastic "paddle" containing dual media. Appl Microbiol 23:919, 1972.
18. Jackaman FR, Darrell JH and Shackman R: The dip-slide in urology. Brit Med J 1:207, 1973.

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References:

1 Dornfeld L, Kane R. Metolazone in essential hypertension. The long-term clinical efficacy of a new diuretic. *Curr Ther Res* **18**: 527-533, 1975
2 Data on file, Medical Department, Pennwalt Prescription Products

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History

Plasma Cell

100 Year Anniversary:
A Brief Chronology

EMIL MARO SCHLEICHER, Ph.D.*

IN 1875 WALDEYER[1] described round cells with a clear, abundant cytoplasm in the adventitia of arterioles, venules, and capillaries. He named these pericytes "Plasmazellen" (plasma cells). Waldeyer noted that some of the cells phagocyted fat droplets.

Many authors have written since about plasma cells, their phylogeny, morphology, cytochemistry, ultrastructure, staining characteristics, and production and secretion of immunoglobulins in health and disease. Yet the plasma cell remains an enigma.

Here I present a brief chronological sequence of outstanding publications relating to the plasma cell.

Ehrlich in 1877-78[2,3] demonstrated with aniline dyes a strong metachromasia of plasma cells droplets. He named these cells "Gewebsmastzellen" (tissue mast cells).

At a scientific meeting in 1895 Waldeyer[4] accepted the name change for these cells.

In 1890 and 1896, Santiago Ramón y Cajal[5,6] described round to oval cells with an accentrically located nucleus in syphilitic condilomas. He referred to the cells as "celula embrionaria" and "corpuscules cyanophiles." The latter term means bluish-violet staining cells. Cajal used the names interchangeably and in 1906 published a detailed description of his cyanophiles.[7] He shows in his Figure 1 which is the same as Figure 53 in his textbook of 1896 plasma cells in a syphilitic condyloma. The cells are of a mononuclear and binuclear type. In his Figure 2 Cajal presents morphological variations of the cells with two in mitosis. He describes plasma cells this way.

"A spherical or elipsoidal cell varying in diameter from seven to 14 micra. The cytoplasm is deeply basophilic and often contains vacuoles. The unstained perinuclear area contains the apparatus of Golgi. The spherical to elipsoidal nucleus is nearly always in an eccentrical position and has a distinct chromatic network."

Cajal found these cells in normal and pathologic tissue and organs. He identified plasma cells as a distinct cell type, a normal constituent of connective tissue, and as a transformed tissue lymphocyte. Cajal's cyanophile is identical with the mature plasma cell. Thus Cajal was first to see, describe and illustrate true plasma cells.

Unna in 1891 and 1913[8,9] published articles in which he speaks of plasma cells in tissues obtained from lupus patients. Unfortunately Unna failed to describe the cells. He referred only to the strong basophilia of the cytoplasm, a property not exclusively characteristic of plasma cells. Whether Unna saw true plasma cells remains unknown. Therefore, one cannot justify calling the cells "Unna's plasma cells."

Attention to the nucleus of the mature plasma cells was directed in 1895 and 1899 by von Marschalkó.[10,11] He described the nucleus to be round to oval, tends to be accentrical, and its chromatin masses are often arranged in a wheel-spoke pattern. No nucleoli are present. In the deeply basophilic cytoplasm is a juxta-nuclear zone. He believed the plasma cell a transformed lymphocyte, and a specific cell type.

In the first article[10] von Marschalkó shows a drawing of plasma cells within and about a vessel. The morphological descriptions and illustrations of mature plasma cells by von Marschalkó and Cajal are strikingly similar indeed. We do not know if von Marschalkó knew of Cajal's publications. Whatever the case, both men are credited with being first to clarify the designation PLASMA CELL.

Pappenheim[12] in 1901 wrote of a dual stain made up of Methylgreen and Pyronin. He differentiated the stain with a Resorcinol-alcohol mixture observing a strong affinity of the plasma cell nucleus to Methylgreen and the cytoplasm to

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*Research Laboratory, Metropolitan Medical Center, Minneapolis, Minnesota.

Pyronin. This selective reaction results from the presence of desoxyribose nucleic acid in the nucleus, and ribonucleic acid in the cytoplasm.

In the same year Unna[13] replaced the Resorcinol-alcohol in Pappenheim's stain with Glycerin and Phenol. To extract however, the violet components from the Methylgreen reduces the polychromatic properties of the dye. The loss of these dye components is not in all instances desirable.[14]

A large mononuclear cell with an abundant deeply basophilic often vacuolated cytoplasm was described by Türk[15,16] in 1907. The dense chromatic round to Kidney-shaped, or grooved nucleus tends to be accentrically placed. He called the cell "Reizungsform" (irritation form). The cell is probably a pathological immunocyte intermediate between lymphocyte and plasma cell.

Recent Theories of Origin

It seems proper to mention a few recent theories pertaining to the phylogenesis of the plasma cell.

According to Fagraeus[17] the plasma cell is derived from the reticuloendothelial system, whereas Briellmann[18] favors a reticulohistiocytic origin. While Rohr[19] derives the cell from small lymphoid reticulum cells, Schleicher[20] believes the precursor to be a small unipotential reticular lymphocytoid stem cell. An origin by a plasma cell production pathway meaning a small lymphocyte enlarges into a blast-like cell, which undergoes mitosis and differentiates into a plasma cell is proposed by Zlotnick.[21]

A more complex phylogenesis is presented by Movat and Fernando.[22] The precursor is a small lymphocyte developing into an immunoblast-plasmablast-proplasmacyte-mature plasma cell. According to Undritz[23] the plasma cell is the endstage of the plasmablast a specific stem cell. Finally it is the opinion of Kreth and Herzenberg[24] lymphocytes with highly density of membrane-bound immunoglobulin are the precursors of plasma cells. The present day knowledge pertaining to the origin of the plasma cell may be summarized as follows. Thymus-derived lymphocytes migrate to lymphoid tissue, where the cells come in contact with antigen. The latter is presented to B lymphocytes (bone marrow derived lymphocytes) which become stimulated, divide and differentiate into antibody-producing plasma cells. The mechanism of discharge of the antibody is not understood.

Interesting hypotheses pertaining to the phylogenesis of plasma cells before 1931 are presented by Michels.[25]

The first investigators to study the ultrastructure of plasma cells with the aid of an electron microscope were Braunsteiner et al.,[26] and Braunsteiner and Pakesch.[27] They found an abundant amount of rough endoplasmic reticulum organized in concentric laminae in the cytoplasm. And in the cysternae of these structures, Sharff and Laskov[28] demonstrated the presence of gammaglobulin and antibody. According to these investigators plasma cells synthesize, assemble, and secrete gammaglobulin molecules. Because of the heterogeneity of normal and neoplastic plasma cells one or more immunoglobulins may be produced making it often difficult to clearly separate a benign from a malignant plasma cell proliferation.

This discourse on the plasma cell would not be complete without giving thought to the most common plasma cell dyscrasia "Multiple Myeloma" (Plasmocytoma).

Multiple Myeloma (Plasmocytoma)

The first description of Multiple Myeloma is credited to Solly[29] who in 1844 presented two female patients with Mollities ossium who had multiple bone lesions and fractures. The autopsy bone marrow contained round to oval cells with a clear cytoplasm, and rarely two or more nuclei with a distinct nucleolus. These two cases are compatible with Multiple Myeloma, and the first recorded case of neoplastic plasma cell proliferation in the bone marrow organ.

MacIntyre[30] in 1850 published the case of a 45 year old male with Mollities ossium who had a large amount of animal matter (protein) in his urine. Dr. MacIntyre saw this patient in 1845, then discovering the abnormality of the urine. By adding nitric acid to the urine a precipitate resulted which disappeared on boiling, and reappeared on cooling. Upon further cooling the precipitate dissolved. Dr. MacIntyre submitted several urine samples to Dr. Henry Bence Jones for chemical analysis. He classified the albumin as an hydrated dentoxide.[31] With present electrophoretic and immunologic techniques the protein is of a light-chain class Kappa or Lambda, also referred to as M or myeloma protein.[32] From the historical point of view the protein should be called "MacIntyre-Bence Jones Protein".[33]

In 1846 Dalrymple[34] described the autopsy findings of Dr. MacIntyre's patient commenting on the striking similarity of the pathology of Dr. Solly's patient.

The name "Multiple Myeloma" was introduced by von Rustizky[35] in 1873. He derived the term from the Greek word "Myelos" meaning marrow and multiple because the tumor was multifocal.

The characteristic clinical symptoms of Multiple Myeloma were formulated by Kahler[36] in 1889 .Thus some know the plasma cell neoplasm as Kahler's Disease. It was Wright[37] who in 1900 recognized the association of neoplastic proliferation of plasma cells and multiple myeloma and Apitz suggested the designation "Plasmocytoma" for this most common plasma cell neoplasm.[38] The term is widely used to identify a neoplasm of the plasma cells producing monoglonal protein, with or without concomitant proteinuria of the MacIntyre-Bence Jones type.

While the plasma cell has its 100 year anniversary, and much has been learned about the cell, its phylogenesis is still an enigma. Moreover, the cause underlying Multiple Myeloma (plasmocytoma) has so far eluded students of this common plasma cell neoplasm.

References

1. Waldeyer W: Ueber Bindegewebszellen. Arch mikrosk Anat 11:176, 1875.
2. Ehrlich P: Beiträge zur Kenntnis der Anilinfärbungen and ihrer Verwedung in der mikroskopischen Technik. Arch mikrosk Anat 13:263, 1877.
3. Ehrlich P: Beiträge zur Kenntnis der Granulierten Bindegewebszellen und der eosinophilen Leukocyten. Arch Anat Physiol 3:166, 1879.
4. Waldeyer W: Über Bindegewebszellen, insbesonderoe über Plasmazellen, Sitzungsbericht d. Kgl. preuss. Akad. Wissenschaften, 11. July 1895.
5. Cajal SR y: Manual de Anatomia Pathologica General. 1st ed. Barceloma, 1890.
6. Cajal SR y: Manual de Anatomía Pathólogical General. 2nd ed. Madrid, Moya, p. 212, 215, 1896.
7. Cajal SR y: Quelques antécédents historiques ignores sur les Plasmazellen. Anat Anzeiger 29:666, 1906.
8. Unna PG: Über Plasmazellen, insbesondere beim Lupus. Monatshefte Prakt Dermat 12:296, 1891.
9. Unna PG: Die Herkunft der Plasmazellen, Virchows Arch Path Anat 214:320, 1913.
10. Marschalkó Th.von: Ueber die sogenannten Plasmazellen, ein Beitrag zur Kenntniss der Herkunft der entzündlichen Infiltrationszellen. Arch Dermat Syph 30:3, 1899.
11. Marschalkó Th.von: Zur Plasmazellenfrage. Centralbl Allg Path und Path Anat 10:851, 1899.
12. Pappenheim A: Eine neue, chemisch-elektive Doppelfarbung für Plasmazellen. Monatshefte prakt Dermat 33:79, 1901.
13. Unna PG: Eine modification der Pappenheimschen Farbung auf Granuloplasma. Monatshelfte prakt Dermat 35:76, 1920.
14. Lilly RD: H. J. Conn's Biological Stains, 8th ed. Baltimore, Williams and Wilkins, 1969.
15. Türk W: Septische Erkrankungen bei Verkümmerung des Granulocytensystems. Wiener Klin Wchnschr 20:157, 1907.
16. Türk W: Ueber Regeneration des Blutes under normalen and krankhaften Verhältnissen. Zeitbl Allg Path und Path Anat 19:895, 1908.
17. Fagraeus A: Antibody production in relation to the development of plasma cells. Acta Med. Scand Supple 204:5, 1948.
18. Briellmann A: Über Plasmazellenbefunde in Lymphknoten bei Leberzirrhosen und die Bedeutung der Russellschen Körperchen. Schweiz Ztschr Allg Path und Bakt 18:335, 1955.
19. Rohr K: Das menschliche Knochenmark. 3rd ed. Stuttgart, Thieme, 1960.
20. Schleicher EM: Bone Marrow Morphology and Mechanics of Biopsy. Springfield, Thomas, 1973.
21. Zlotnick A: In J. M. Joffey, The Lymphocyte in Immunology and Haemopoiesis. London, Arnold, 1967.
22. Movat HZ and Fernando NVP: The fine structure of lymphoid tissue during antibody formation. Exp. and Mol Path 4:155, 1965. e
23. Undritz E: Sandoz Atlas of Haematology. 2nd ed. Bassel, Sandoz, 1973.
24. Kreth UW and Herzenberg LA: Fluorescence-activated cell sorting of human T and B lymphocytes. Direct evidence that lymphocytse with a high density of membrane-bound immunoglobulin are precursors of plasmacytes. Cellular Immunology, 12:396, 1974.
25. Michels N: The plasma cell. Arch Path 11:775, 1931.
26. Braunsteiner H, Fellinger K and Pakesch F: Demonstration of a cytoplasmic structure in plasma cells. Blood 8:916, 1953.
27. Braunsteiner H and Pakesch F: Electron microscopy and the functional significance of a new structure in plasma cells: A review. Blood 10:650, 1955.
28. Scharff MD and Laskov P: Synthesis and assembly of immunoglobulin polypeptide chains. Prog Allerg 14:37, 1970.
29. Solly S: Remarks on the pathology of Mellities ossium. Trans Royal Med and Chir Society, London, 27:435, 1844.
30. MacIntyre W: Case of Mellities and Fragilitas ossium. Royal Med and Chir Society, London, 33:211, 1850.
31. Bence Jones H: On a new substance occurring in the urine of a patient with Mollities ossium. Philosoph Trans Royal Society, London, 138:55, 1848.
32. Clamp JR: Some aspects of the first recorded case of multiple myeloma. Lancet 2:1354, 1967.
33. Kyle RA: Multiple myeloma. Review of 869 cases, Mayo Clinic Proc 50:29, 1975.
34. Dalrymple J: On the microscopical character of Mollities ossium. Dublin Quart J Med Sci 2:85, 1846.
35. Rustizky J von: Multiple myeloma. Dtsch Zeitschr Chir 3:162, 1873.
36. Kahler O: Zur Symptomatologie des multiplen Myelomas. Prag med Wschr 14:33 and 45, 1889.
37. Wright JH: A case of multiple myeloma. Trans Assoc American Physicians 15:137, 1900.
38. Apitz K: Die neuen Anschauungen vom Plasmocytom des Knochenmarks. Klin Wschr 19:1025, 1940.

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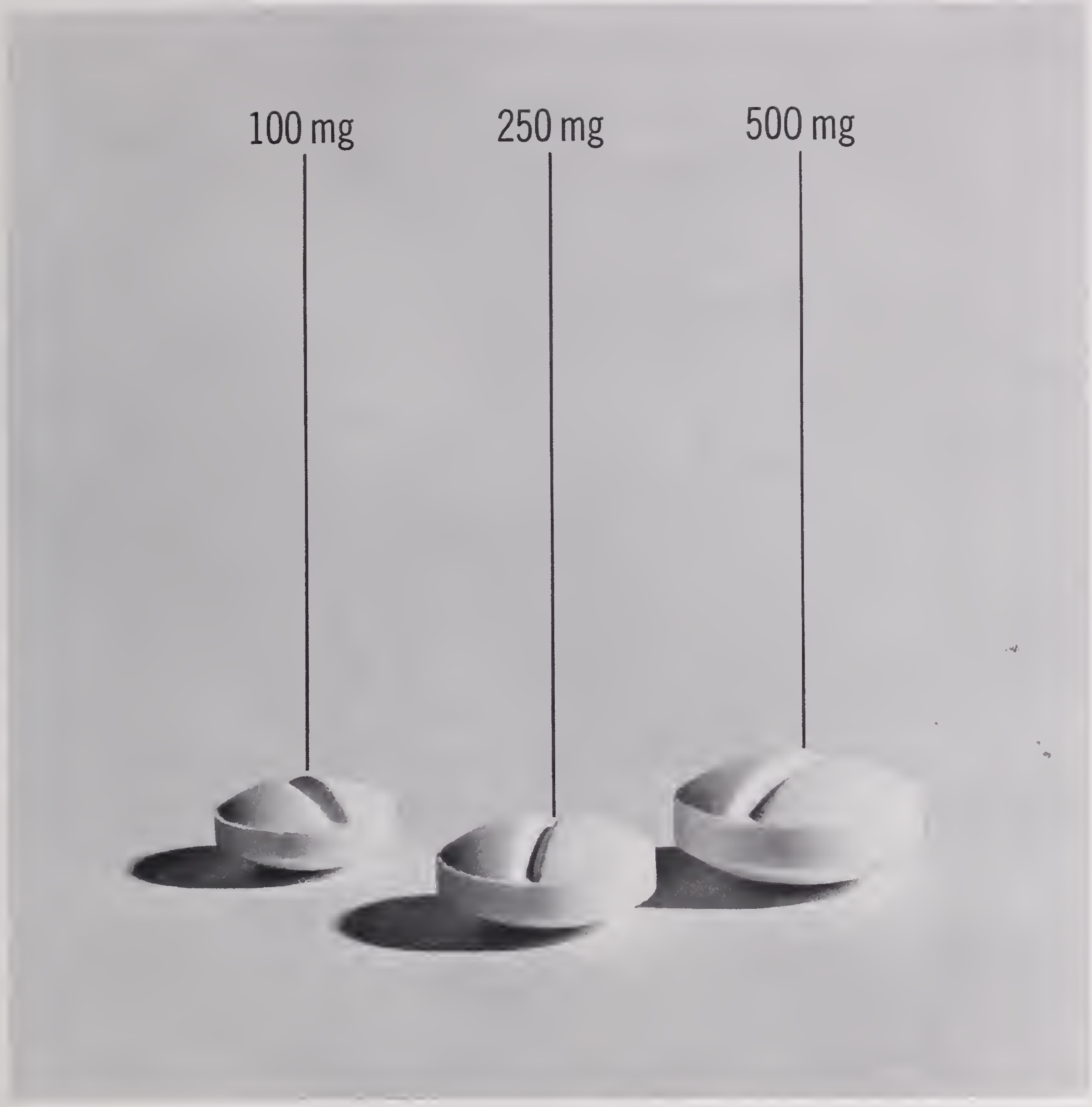
(Continued on page 145)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MSMA Highlights

Report on MSMA Health Planning Program

Since the Annual Meeting last May, there has been a great flourish of activity in the area of health planning. In Minnesota there are now seven Health Service Areas, three of which are bi-state, two overlap with North Dakota, and one overlaps with Wisconsin in the Duluth-Superior Region. For each of these Health Service Areas a Health System Agency has been designated. These agencies have received conditional grants for periods ranging from one to two years. The size of the governing boards for each HSA range from 30-66 members. A total of twenty physicians sit on these boards, ranging from two to five representatives per board.

On September 1, 1976, Governor Anderson, in compliance with Public Law 93-641, announced his selection of the State Planning Agency under the direction of Mr. John Dilley as the State Health Planning and Development Agency. This agency will be responsible for coordinating the health planning activities of the entire state.

On November 8, 1976, Governor Anderson announced the appointments to the State Health Coordinating Council. This council will have 35 members and of these 35 members, seven providers and 14 consumers were appointed from the HSA Boards, 13 additional members were Governor appointees, and one member is a representative of the Veterans Administration as required by law. There were three physicians appointed to this council: Leslie A. Syverson, M.D., Fergus Falls; Vernon L. Sommerdorf, M.D., St. Paul; and James H. Kelly, M.D., St. Cloud. This council will be responsible for the annual review and coordination of the Health System Plan and Annual Implementation Plans of each of the Health Service Areas.

With the creation of the Division of Socio-Economic Affairs, a new Department, and a new Committee on Health Planning were added to the staff and committee structure of the Minnesota State Medical Association. Since April, staff has been involved in two main areas:

First, the establishment and operation of Physician Health Forces to provide and coordinate physician input into the planning process on a local basis. At present, two of these Physician Health Forces are in operation, one in the metro area and one in the Fargo-Moorhead area. The goal is to establish a Physicians' Health Force in each HSA area by May of 1977. This concept of establishing local Physician Health Forces to provide timely and effective input into the local HSA Boards has been reviewed and is currently being recommended nationally by the American Medical Association as a method of providing physician input into the planning process.

The second major activity of staff has been to review and coordinate physician input into the development of planning guidelines. Since April, approximately 400 Minnesota physicians have attended over 40 meetings to review numerous sets of guidelines, usually in the area of perinatal and pediatric care. An example of their success in this area is the fact that the Metropolitan Health Board's Pediatric and Perinatal Guidelines are now into their fourth and fifth revision respectively.

Subcommittees have been assigned to rewrite each of these guidelines as well as an introduction stating the philosophy for the guidelines. Out of the thirteen members who are assigned to these committees twelve are physicians, and five of those twelve physicians were not original members of the Task Forces. This is a *clear* example of local physician input into the planning process and was due to the increased involvement by local physicians.

Finally, on October 15, 1976, the Minnesota State Medical Association's new Health Planning Committee met for the first time. This committee is comprised of physician representatives from the HSA Boards, Physician Health Forces, and a representative from the State Health Coordinating

Council. This committee will be responsible for coordinating physician input on a statewide basis into the health planning process.

The Minnesota State Medical Association is on the move. Timely and constructive input into the planning process is being provided by the Association and MSMA has been recognized nationally by the AMA and HEW.

John B. Coleman, M.D., Chairman
Minnesota State Medical Association
Committee on Health Planning

Minnesota Society of Clinical Pathologists
Symposium of the Lung
Saturday, April 23, 1977
Health Sciences Building, University of Minnesota

9:45-10:00 a.m.	Welcome Address and Announcements, Donald Larson, M.D.
10:00-10:45 a.m.	Functional Anatomy and Histology of the Lung, W. Robert Anderson, M.D.
10:45-11:30 a.m.	Pulmonary Diseases of Uncertain Etiology, Donald F. Gleason, M.D.
11:30-12:00 a.m.	Interpretation of the RAST Test, Henry A. Homburger, M.D.
12:00- 1:30 p.m.	Luncheon at Campus Club, Coffman Union
1:30- 2:00 p.m.	Laboratory Diagnosis of Viral Pneumonia, Henry Balfour, Jr., M.D.
2:00- 2:45 p.m.	Carcinoma of the Lung, Robert S. Fontana, M.D.
2:45- 3:00 p.m.	Coffee
3:00- 3:30 p.m.	Pulmonary Cytology, Lewis B. Woolner, M.D.
3:30- 4:30 p.m.	Pathology of Pulmonary and Mediastinal Tumors, Tumors of the Lung, Stephen L. Ewing, M.D. Tumors of the Mediastinum, Juan Rosai, M.D.

Tuition: $25.00 (includes luncheon, lecture summaries, and booklet of 35 mm. slides; dinner additional). Applications to: Wayne A. Chadbourn, M.D., Secretary, 900 South 8th Street, Minneapolis, Minnesota 55404. ASCP accredited for Continuing Medical Education.

References

Editor's Notebook—Reece (page 78B)

1. Lister J: The Royal Commission and the morale of the medical profession. New Engl J Med 295:1523, 1976.
2. Reece RL: A visit with an English pathologist. Pathologist, pp 52-55, 1972.
3. Fox TF: Industrial Action, The National Health Service and the Medical Profession. Lancet, 2:892, 1976.
4. Birley JLT: Medicine: Profession or Industry. Lancet: 895-896, 1976.
5. Gailbraith NS: What I would say to the Royal Commission: community medicine attitudes. Br Med J 2:805. 1976.
6. Beard RW: What I would say to the Royal Commission: maternal and neonatal care—a priority. Br Med J 2:679, 1976.
7. Drife JO: What I would say to the Royal Commission: our neglected wastelands. Br Med J 2:741, 1976.
8. Godber G: Dear Royal Commissioners: fair shares in the N.H.S. Lancet 2:622, 1976.
9. Amanda Bennett: "Canada's National Health Plan. Wall Street Journal, December 13, 1976.
10. Drucker Peter F: "The Age of Discontinuity: Guidelines to Our Changing Society." New York and Evanston. Harper & Row, 1969.
11. Meyer MF: The National Health Insurance Debate: shifts toward reality? 1:13-17, 1976. J Health Politics, Policy and Law.

Child Abuse and Neglect

A Minnesota Update—1977 Beyond the Battered Child Syndrome

DESMOND K. RUNYAN, M.D., M.P.H.* and ROBERT W. ten BENSEL, M.D., M.P.H.†

Child abuse and neglect are social symptoms and medical disorders that require the attention of all physicians and other professionals caring for children. Increasing knowledge of the spectrum of child abuse is reflected in the increased reporting of abuse and in the increased attention by the general population to the problem. Reports of child abuse in Minnesota have increased dramatically in the last five years. In Hennepin and Ramsey Counties 1285 cases of physical and sexual abuse have been reported since 1971, 396 cases in the two counties in 1975 alone. The 1975 Minnesota State Legislature enacted a new "Maltreatment of Minors Reporting Law" which clarified the definition of abuse and expanded the definition to include sexual abuse. It included as abuse the existence of any physical injury to a child which cannot be reasonably explained by the parent or other responsible adult. The new law also expanded the number of people mandated to report suspected abuse cases to include any professional or his delegate who is engaged in the healing arts, social services, hospital administration, psychology, child care, education, or law enforcement. The law also provides for voluntary reporting of neglect. The changes in the law and the increase in reported cases will affect the role of the physician in the prevention, diagnosis, and treatment of child abuse and neglect.

SINCE THE EARLY REPORTS about "the battered child syndrome" in this journal,[1,2] the broad spectrum of child rearing behaviors called abuse and neglect has become even more apparent. The battered child is only the most blatant victim of abuse and neglect. Many other children also suffer serious, but less obvious injury as a result of acts of commission and omission, both physical and emotional, perpetrated by their parents or other adults. The concern for children suffering from inappropriate rearing practices has brought us beyond the "battered child syndrome."

1975 Minnesota Law

The 1975 Minnesota State Legislature enacted a "Maltreatment of Minors Reporting Law."‡ This law clarified the earlier Minnesota statutes dealing with child abuse. The new law states that the public policy of the state is to prevent "jeopardy to the health and welfare of the child through physical abuse, neglect, or sexual abuse," as well as strengthen the family, provide a safe environment for abused children and make provisions for the reporting of abuse and neglect. The law defines physical abuse as "physical injury inflected by a parent, guardian, or other responsible person or . . . the existence of any physical injury which cannot be reasonably explained by the parent, guardian, or other person responsible for the child's care."

This new Minnesota Statute, which went into effect August 1, 1975, expanded the number of individuals mandated by law to report suspected child abuse to the local welfare agency or to the police department. Any "professional or his delegate who is engaged in the healing arts, social services, hospital administration, psychological or psychiatric treatment, child care, education, or law enforcement" must report suspected child abuse. Failure to report is a misdemeanor, punishable by not more than 90 days in jail or a fine of not more than $300, or both. Any other individual not included among those required to report may report any suspected or known abuse. All persons reporting in good faith with due care, shall be immune from any civil or criminal liability. The effect of the change in the law is to include the delegates or employees of the physician, as well as the school system and child care services, among those who must report suspected abuse.

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*Pediatric Resident, University of Minnesota Hospitals, Minneapolis.

†Professor and Director of the Program in Maternal and Child Health, University of Minnesota School of Public Health, and Professor of Pediatrics, University of Minnesota Medical School, Minneapolis.

Reprint requests may be sent to: Robert ten Bensel, M.D., School of Public Health, 1342 Mayo, Box 197, University of Minnesota, Minneapolis, Minnesota 55455.

‡Minnesota Statutes 1975—Chapter 626.556.

Sexual Abuse

Sexual abuse of children has been an unpopular area of investigation. The reported abuses run a wide spectrum of incest, sodomy, and rape and clearly fall in all four categories of criminal sexual conduct delineated in Minnesota's new criminal sexual conduct law. Because of the social hesitancy to report and the unsuspected nature of the diagnosis, the true extent of the problem is largely unknown.

Sexual abuse is included by the new statute as a part of the child abuse problem and tied in with the provisions of the new Minnesota Criminal Sexual Conduct Law.* Sexual abuse is defined when a "child's parents, guardian, or person responsible for the child's care subjects a child under 16 years of age to the sex acts of rape, sodomy, intercourse, indecent liberties, or any other violations of the four degrees of criminal sexual contact." The degrees of criminal sexual contact are complicated and pertain to the criminal system. A complete description of the law is beyond the scope of this paper.

Neglected Child

The "Maltreatment of Minors Reporting Law" enacted in 1975 has also defined a "neglected child" (Minnesota Statute Section 260.015, Subdivision 10) and provides for *voluntary* reporting of neglect. A "neglected child" is a child under 18-years-of-age who has been abandoned or is without proper care through faults or habits of parents or whose physical and mental health or moral needs have not been provided by the parents. The law also includes children placed in unauthorized foster home arrangements or who are delinquent from parental neglect as "neglected children." Neglect, and especially "emotional neglect," has been identified as a state concern but the difficulty in arriving at appropriate definitions has prevented the state from requiring mandatory reporting.

Increasing Abuse and Neglect

Statistics from Ramsey County, Hennepin County, and from the entire state suggest an increasing rate of abuse and neglect. The increase is due largely to increased reporting secondary to increased awareness of the problem and to wider responsibility for reporting child abuse. Ramsey County has seen an increase in reported cases of physical abuse from seven in 1965 to 77 in 1974 and 98 in 1975. Hennepin County had 15 reported cases of abuse in 1965. This figure rose to 213 in 1974 and to 274 in 1975. These last two figures include only physical and sexual abuse.

Statistics from national studies in the 1960's indicated that parents were the principal abusers and specifically that the mother was frequently the culprit.[3] Statistics from 1975 in Hennepin and Ramsey Counties suggest that males are the most frequent abusers and that adults who are not the parents (i.e., boyfriends, babysitters, etc.) are more frequently found to be abusers. Recent changes in divorce and remarriage patterns, adoptive patterns, and work patterns may explain these shifts.

National studies have characterized the host, or abused child as an infant under three, most commonly male, and different in some physical or emotional way.[3] Hyperactive children, retarded children, or children with other physical handicaps appear more prone to abuse. The child who suffers prolonged separation from the family, as occurs to children hospitalized in a neonatal intensive care unit, has an increased risk.

Hennepin County and Ramsey County

In Hennepin County, since 1963, 40% of the abused or neglected children reported have been under the age of three. The percentage of children reported as victims of abuse or neglect in Ramsey County who were under the age of three was 24% in 1975. The percentage of abused children ages nine to 18 reported to Ramsey County Welfare, increased in 1975 to 44% of all reported cases, from 26% the previous year. The smaller percentages of young children reported to be abused or neglected in the metropolitan counties when contrasted to national studies may represent disproportionate underreporting in that age group or relatively greater reporting of older children by school personnel. The increase in reported adolescence abuse in Ramsey County may be a direct result of the law requiring schools to report in Minnesota, but it is too early to determine a definite trend.

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*Minnesota Statute 1975—Chapter 374.

Environmental Impact

The environmental impact on child abuse and neglect is difficult to quantitate. The increase in reported cases may also result from the downturn in the economy. If this is the case, one would expect the annual increase in reported cases to be less dramatic in the next few years if the economy improves. The statistics from Minnesota suggest that few reported cases of abuse occur in families with an income above $10,000 per year. In 1975 in Ramsey County, 19.5% of the families of an abused child had an income over $10,000. Only 5% of the abusers were college graduates.

Since 1963, only 10% of all child abuse or neglect reports in Hennepin County have come from physicians, although physicians have always been mandated to report abuse. In Ramsey County, only four of the 98 cases of abuse or neglect reported to the county welfare department came from private physicians.

Barriers to Physician Involvement

Physicians apparently have been reluctant to become involved in child abuse and neglect. The barriers to physician involvement are multiple.[4] Physicians have not been given appropriate training about child abuse at either the undergraduate or graduate training level. Medical schools traditionally have not emphasized developing interpersonal communication skills. Physicians, by the nature of their training, are often isolated from the other health disciplines and may have difficulty working with them as peers. The personal rewards from working in the area are minimal and supportive feed-back from other

TABLE
Minnesota State Law

Subdivision 1—Public Policy. The legislature hereby declares that the public policy of this state is to protect children whose health or welfare may be jeopardized through physical abuse, neglect, or sexual abuse; to strengthen the family and make the home safe for children through improvement of parental and guardian capacity for responsible child care; and to provide a safe temporary or permanent home environment for physically or sexually abused children.

In addition, it is the policy of this state to require the reporting of suspected physical or sexual abuse of children; to provide for the voluntary reporting of neglect of children; to require investigation of such reports; and to provide protective and counseling services in appropriate cases.

Subdivision 3—Persons Mandated to Report. A professional or his delegate who is engaged in the practice of the healing arts, social services, hospital administration, psychological or psychiatric treatment, child care, education, or law enforcement who has knowledge or reasonable cause to believe a child is being physically or sexually abused shall immediately report the information to the local welfare agency or police department . . . Nothing in this subdivision shall be construed to require more than one report from any institution facility, school, or agency.

Subdivision 6—Failure to Report. Any person required by this section to report suspected physical or sexual child abuse who willfully fails to do so shall be guilty of a misdemeanor.

Subdivision 7—Report. An oral report shall be made immediately by telephone or otherwise. An oral report made by a person required under Subdivision 3 to report shall be followed as soon as possible by a report in writing to the appropriate police department or local welfare agency. Any report shall be of sufficient content to identify the child, the parent, guardian, or other person responsible for his care, the nature and extent of the child's injuries and the name and address of the reporter.

Subdivision 8—Evidence Not Privileged. No evidence regarding the child's injuries shall be excluded in any proceeding arising out of alleged physical or sexual abuse on the grounds of either physician-patient or husband-wife privilege.

professionals has often been non-existent. Physicians are not cognizant of their possible role as a change agent in society. Education about planned change and the role of the change agent might enable the physician to assume an active role in directing preventive health services.

Physician's Time

Working in the area of child abuse may become a significant drain on the time and finances of the physician. To the time devoted to the care of the abused or neglected child must be added the time spent with the parents, social service agencies, and frequently, the courts. Insurance or private remuneration for the time spent is unlikely. Physicians may have little understanding about the role of community social services in the abuse and neglect area and many may be generalizing from their previous poor experiences with other community agencies.

Fears of Physicians

Fear of the law or going to court may prevent some physicians from reporting abuse: a not unreasonable response as physicians are not trained to deal with the law. Fear of malpractice suits is another likely inhibitor of full cooperation by physicians. In an adversary legal system seeking adversaries may not appear to be a sensible course. Even without the threat of a suit, fear of dealing with irate parents may be a significant deterrent in and of itself. Conflict resolution has not been a part of most medical curriculums.

Since 1962, considerable knowledge has accumulated about the medical and social aspects of child abuse and neglect. The physician is in a key position to "suspect" individual cases and to cooperate with community services in the evaluation of cases referred or identified by others. Physicians are also helpful in participating in case conferences in the community. Child Abuse and Neglect teams around the county are finding that the cooperation of the private physician is necessary for both satisfactory evaluation and effective resolution of the abuse or neglect situation. The physician's role primarily involves awareness of the problem of maltreatment, judgment about "suspect" cases which have been reported, documentation of the injuries or neglect which may have occurred, and communication and cooperation with the other professionals who are working to protect and care for children and strengthen or rehabilitate families.

References

1. ten Bensel RW, Raile RB: The battered child syndrome. Minnesota Med 46:977, October 1963.
2. Allen HD, ten Bensel RW, Raile RB: The battered child syndrome. Minnesota Med 51:1793 (1968), 52:155 (1969), 52:345 (1969), 52:539 (1969).
3. Gil D: Incidence of child abuse and demographic characteristics of those involved. From The Battered Child. 1st edition, Helfer R and Kempe CH editors. Chicago: University of Chicago Press, 1968.
4. Helfer R: Why most physicians don't get involved in child abuse cases and what to do about it. Children Today 4:28, 1975.

An extensive list of references and statistics about abuse in Hennepin and Ramsey Counties in 1975 is available from the authors.

The Children's Hospital

Dr. Ivan Schloff, a St. Paul orthopedic surgeon, has been named Chief of Staff of the St. Paul Children's Hospital Medical Staff for 1977.

Dr. Schloff joined the Children's Hospital Staff in 1959 and has been in private practice in St. Paul since that time. He currently serves on several medical staff committees at Children's Hospital.

Dr. William Brennom, St. Paul pediatric surgeon, was elected Chief of Staff-Elect; Dr. Raymond P. Lynch is Secretary-Treasurer.

(Continued from page 134)

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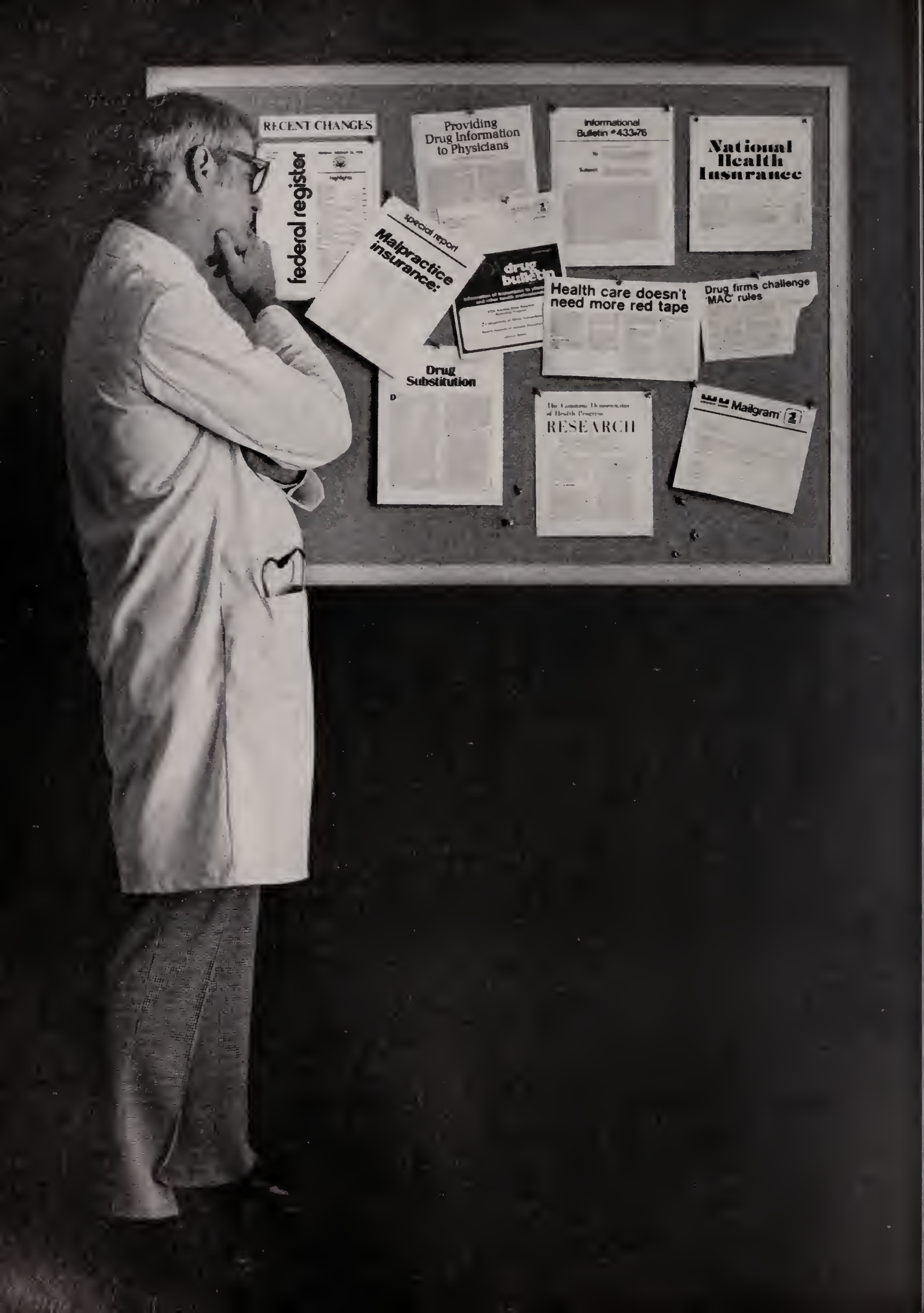
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Drug substitution In most states, pharmacy laws, regulations or professional custom stipulate that your non-generic prescriptions be filled with the precise products you prescribe. But in the last five years, a dozen or more State laws have been changed, permitting the pharmacist in most cases to select a product of the same generic drug to fill any prescription.

Ironically, this dilution of physician control has taken place against a background of growing evidence that purportedly equivalent drug products may be inequivalent, since neither present drug standards nor their enforcement are optimal. In fact, the FDA itself says it has not enforced the same standards for hundreds of "follow-on" products that it had applied to the original NDA approvals. Thus physician control over patient therapy is being eroded with a risk that patients may be exposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced prescription prices for consumers. Yet no documentation of any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is a Federal regulation designed to cut the Government's drug bill by setting price ceilings for drugs dispensed to Medicare and Medicaid patients. Unless the prescriber certifies on the prescription that a particular product is medically necessary, the Government intends to pay only for the cost of the lowest-priced, purportedly-equivalent, generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than $1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

The FDA needs adequate time, of course, to consider data. But it is equally clear that the present approval process contributes to needless delay of needed therapy. That's why the increased efficiency of the drug approval process is vital to all our futures.

If these issues concern you, we suggest that you make your voice heard—among your colleagues and your representatives in State legislatures and in Washington.

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MARCH 1977

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Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma, may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed, drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported, should these occur, discontinue drug. Isolated reports of neutropenia, jaundice, periodic blood counts and liver function tests advisable during long-term therapy.

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President's Letter

Cost Containment

"Cost containment," "cost effective," or "cost control" are the current popular cliches, all referring to the dollar value of health and health care services currently being used by health planners, medical writers, politicians, and other health care experts. These cliches will have a profound effect on the private practitioner in the very near future. They are the real impetus behind the regulations of Medicare-Medicaid, HMO, HSA, and PSRO legislation and the only reason for considering a major reorganization of the health industry through national health insurance.

We are bombarded with statistics referring to costs—usually quoting billions of dollars of expenditures, marked escalation in costs, increase in gross national product, etc. Most statistics, because of repetition and questionable source, are making the majority of physicians turn the other cheek. There is one, however, that has impressed me and was initially heard in Boston in August, 1976, and re-read in the January 31, 1977 issue of AMA News by the Princeton economist, Uwe Reinhardt. He stated that every physician generates at least $250,000 in direct and indirect costs each year.

A recent patient care magazine article about cost containment gave a 24-hour cost illustration of a family physician in Wisconsin. He actually through the decision-making process generated $13,000 in costs in that period of time. Multiply this figure times five days and times 40 weeks would equal approximately $2.6 million dollars per year. Alarming? Yes. True? Probably. Sobering? Indeed.

As physicians we must first be present, make accurate prompt diagnoses, and prescribe exacting therapy to bring about the most appropriate final result in light of present day medical knowledge. And now, in addition, we must add to this cost containment.

Minnesota was a pioneer in the endeavor of cost containment with the formation of the Foundation for Health Care Evaluation. In spite of a fantastic voluntary effort in the Twin City area, it apparently was too late, too local, or not contagious. So, the federal government added PSRO. This added admission certification as a further attempt to control costs.

If we look at the monetary statistics that we can effect with our judgment in caring for each individual patient—what tests we order for appropriate diagnosis, etc.—we ask several questions. Is referral necessary? Was preadmission testing performed? Did we send the lab and x-ray results along with the patient if admission was necessary? Are there alternatives to hospitalization such as: home care, extended care, and so forth? Did we succumb to the demands of relatives? Did we learn the actual costs of what we ordered? These and many other cost-related questions are pertinent to the times. Positive answers, even if honest, forthright, and appropriate, are disbelieved by most except our own patients.

There is much to be done, and we will address ourselves to the problem. The government and other health planners have moved in. Private concern was expressed through the National Association of Manufacturers when they gave us 18 months to put our house in order or their previous conservative approach to health care delivery would change, and they would demand total government control of health care and its providers.

Responding, we have formed a Commission on Health Care Costs charged with studying the health care systems in Minnesota, their relationship with the national problem of escalating health care costs, and, when completed, will make recommendations to the Council for State Association's sponsorship of proposals designed to control costs inherent in the health delivery system in Minnesota. The life of the Commission will be 18 months. Meetings will be held every other month for an entire day. The Commission will be made up of 21 members, representatives of groups and organizations in Minnesota with a stake in health care costs. They will represent providers of hospital and medical care, government, insurance, labor, economists, business, industry, and allied health organizations. In consort with the Foundation for Health Care Evaluation, which has been directly related to cost effectiveness for seven years, an initial study in three areas has been proposed with budgeting. These include: (1) the extent of unnecessary surgery, if it really exists and where, (2) appropriate disability convalescence for illness, surgery, and injury, and (3) professional liability insurance coordinated with a risk management program.

To accomplish all this again will take unity of purpose and a tremendous amount of time. Staff is very capable and willing. Are we physicians willing? The only problem left with me personally in reference to cost containment is that no one ever discusses quality of medical care.

Richard E. Anonsen, M.D.
President
Minnesota State Medical Association

Minnesota Society of Clinical Pathologists
Symposium of the Lung
Saturday, April 23, 1977
Health Sciences Building, University of Minnesota

9:45-10:00 a.m.	Welcome Address and Announcements, Donald Larson, M.D.
10:00-10:45 a.m.	Functional Anatomy and Histology of the Lung, W. Robert Anderson, M.D.
10:45-11:30 a.m.	Pulmonary Diseases of Uncertain Etiology, Donald F. Gleason, M.D.
11:30-12:00 a.m.	Interpretation of the RAST Test, Henry A. Homburger, M.D.
12:00- 1:30 p.m.	Luncheon at Campus Club, Coffman Union
1:30- 2:00 p.m.	Laboratory Diagnosis of Viral Pneumonia, Henry Balfour, Jr., M.D.
2:00- 2:45 p.m.	Carcinoma of the Lung, Robert S. Fontana, M.D.
2:45- 3:00 p.m.	Coffee
3:00- 3:30 p.m.	Pulmonary Cytology, Lewis B. Woolner, M.D.
3:30- 4:30 p.m.	Pathology of Pulmonary and Mediastinal Tumors, Tumors of the Lung, Stephen L. Ewing, M.D. Tumors of the Mediastinum, Juan Rosai, M.D.

Tuition: $25.00 (includes luncheon, lecture summaries, and booklet of 35 mm. slides; dinner additional). Applications to: Wayne A. Chadbourn, M.D., Secretary, 900 South 8th Street, Minneapolis, Minnesota 55404. ASCP accredited for Continuing Medical Education.

Editor's Notebook

National Health Insurance Isn't in the Bag Because It Isn't Peanuts

> *"The coverage must be universal and mandatory. We must phase in the program as rapidly as revenues permit, first helping those in need and achieving a comprehensive program in the end."*
>
> Jimmy Carter

On January 20, 1977, the day Jimmy Carter was inaugurated, The *Wall Street Journal* reported the new president had decided to go slow on major social welfare programs.[1] The big things he wanted—government reorganization, welfare reform, and a new health-insurance system—were simply too complicated and controversial to carry out quickly. Indeed, Joseph Califano, the new HEW Secretary, probably wouldn't even get around to introducing a health-care package until middle or late 1978.

Backing Off

Why has Carter backed off his campaign rhetoric?

After all, he said during the campaign, "health care is the number one problem and important enough even to raise taxes, if necessary." Halfway through his drive for the presidency, he even added medical care was so important an extra "percentage point or two of the gross national product might be needed for health."

Arithmetic

You might find it instructive to examine the arithmetic of Carter's "percent point or two," as another publication has done:[2]

GNP = $1.67 trillion
Federal Government's cut of GNP = 21%
21% = $350 billion
Each percentage point = $16.7 billion
Two percentage points = $33.4 billion
Current federal payout for health = $48 billion (40% of $120 billion total)
Federal payout for health, adjusted by two percentage points = $81 billion
(65% of total or 69% more than now), which isn't peanuts

Between Rock and Hard Place

What has made Carter delay a National Health Bill?

Well, it's those little differences between campaigning and governing, between promises and responsibilities, between easy talk and hard choices. Now that our coldest winter has set in, our energy sources are dwindling, and economic indicators are still dropping, he finds himself, as Southerners are fond of saying, "between a rock and a hard place."

Voters' Attitudes

And, of course, there are voters' attitudes.

According to Richard Scammon, director of the Elections Research Center of Washington, D.C.: "The bottom line of politics today is economics. If you ask the voter if he wants national health insurance, he will say yes. If you ask him if he wants to pay higher payroll taxes for national health insurance, he will say no. In other words, if you're going to 'give' it to him, fine; if he has to 'pay,' forget it."[3]

Carter's Strategy

So Carter, a shrewd judge of voters' attitudes, has temporarily delayed his push for National Health Insurance. Earlier in his campaign, he said his strategy was to stimulate our economy enough to achieve a growth rate of the GNP of six percent. At that growth rate, he could "phase in" social welfare programs and still have a "balanced budget." Or, to put it another way, he could be a "social liberal" and "fiscal conservative." He said there was only one exception to this balancing act—national health insurance—which he might bump a "percentage point or two." Well, now in the winter of our economic discontent, he has made an exception of his exception.

Growth and Public Spending

The President has probably been wise.

Two members of Hudson Europe Ltd., a European think tank, have compiled figures indicating increased public spending slows economic growth. More government spending takes money from profits and investments from the more productive private sector, thereby stunting the economy as a whole. The figures also show that the U.S.A., contrary to what liberals think, but right in line with what most voters know already is exceedingly generous with its public money.[4]

TABLE
Public Spending and Growth of Gross National Product

	Government Expenditures (Percent of GNP)	Growth (Annual Percent)
Sweden	25.6%	3.7%
Denmark	23.8	4.7
U.S.A.	23.2	4.4
Canada	22.4	5.5
United Kingdom	20.7	2.5
West Germany	20.4	4.5
Finland	18.6	4.9
Belgium	16.5	4.8
Italy	16.0	4.8
Australia	14.9	5.4
France	14.0	5.8
Switzerland	12.9	4.1
Spain	12.3	6.9
Japan	10.4	10.9

Summary

The Carter administration has delayed introducing a National Health Insurance Bill until 1978. This delay results from uncertain economic conditions and hardening of voter attitudes towards increased taxes to finance such a bill. Increased government spending probably slows economic growth. Carter's philosophy appears to believe that growth should precede spending so that adequate revenues will be available to finance National Health Insurance.

Richard L Reece MD

References

1. Farney D: The Carter Presidency: trying to make things work a little better. Wall Street Journal. 57:70, January 20, 1977.
2. Is NIH Really in the Bag? Perspective 11:15, Winter, 1976.
3. Financing Problems Lie Ahead, Medicine's Leadership Warned. Amer Med News, 20:1, January 31, 1977.
4. Keynes is Dead. Wall Street Journal 57:70, January 31, 1977.

MSMA Socio-Economic Topics

A Message on Health by Minnesota's New Governor, Rudy Perpich

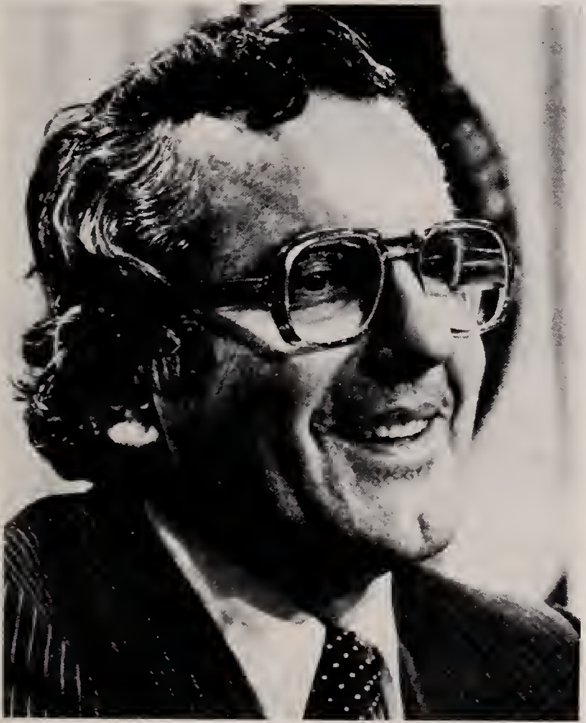
On January 25, 1977, Minnesota's new Governor, Rudy Perpich, presented his budget message to the 70th Session of the Minnesota State Legislature. Health was a major aspect of the Governor's message. Here is a capsulated version of his comments on health and health related subjects:

Licensing Board Consolidation

Consolidation of "health related" licensing boards with the Department of Health and the "non-health related" licensing boards in the Department of Commerce.

Sunset Legislation

Evaluation of all state programs at least once a year, staggered over a four year cycle to determine whether their functions should continue. In addition, the adoption of zero-based budgeting for the 1980-81 state budget.



Governor Rudy Perpich

Creation of the Department of Economic Security

Reorganization of four state departments and five state agencies into two new super agencies or departments. Initial action to create the proposed Department of Economic Security with responsibility for financial assistance, work training, rehabilitation, and job placement.*

Creation of another super agency to be called Department of Health and Social Services with a commissioner appointed by the Governor and the Health Board relegated to an Advisory Committee.*

Closing of Anoka and Hastings State Hospitals

Closing of Anoka and Hastings State Hospitals with greater reliance on utilizing community hospitals for acute care patients. Recommendation includes turning Hastings State Hospital over to the Veterans' Home and utilizing the savings to improve the remaining state hospitals—especially Cambridge.

Health Maintenance

Strong recommendation that the state of Minnesota place more reliance on preventive health care to make citizens more conscious of individual responsibility for health maintenance.

Statewide Health Screening

Proposal that $2.3 million dollars be appropriated to the Department of Education for statewide health screening of all four-year-old children during the next two years. Emphasis in 1978 would be on vision, hearing, immunization and physical and mental handicaps. The 1979 screenings would include laboratory tests, nutrition, and a physical assessment.

Vinland National Center

Minnesota has been chosen by the Norwegian government as the recipient of that government's bi-centennial gift to the nation. The premise of the Center is that people should assume responsibility for their own health. The concept is implemented by taking handicapped people with disabilities such as heart attack victims, paraplegics, the blind and others and restore them to their maximum physical functioning. This effort furthers the determination to place more emphasis on health maintenance.

---

*The MSMA Council on February 16 adopted an Ad Hoc Committee report recommending Association opposition to the creation of the two new super agencies for state human services.

Health Education

Minnesota Department of Health to receive $200,000 in additional funding during the next two years for a special health education effort—primarily in the production of television and radio public service messages and annual Sunday newspaper supplements on preventative health.

Community Health Services

Recommendation that $16.7 million dollars of state subsidies be earmarked for Community Health Services during the next two years to provide matching grants to local governments in support of public health, nursing, disease prevention, health education, nutrition improvement and dental public health activities among others.

Expanded Trails Development

Bonding program of $18 million dollars for acceleration of trail development for skiers, hikers and bicyclers and to build additional tennis courts throughout the state. Again, emphasis on health maintenance is indicated by this recommendation.

Medical Research Funding for University of Minnesota and Mayo

Emphasis here is again on health maintenance and a commitment to combine state dollars with federal and private funds to improve the research facilities of the University of Minnesota and Mayo Clinic to provide pioneering advances in medicine and health care technology as well as new concepts for providing comprehensive care through innovative health care delivery systems.

Medical research would be emphasized with a recommendation that the legislature appropriate $16 million dollars over the next two years to provide matching funds to federal and private funds. Fourteen million dollars of these funds would be given to the University of Minnesota for accelerated research in blood vessel diseases, immunology and genetics and neurosciences. Two million dollars would be provided to the Mayo Clinic for new methods to provide early diagnosis of heart and lung disease; investigate new anticancer drugs, explore the cause of kidney stones and study mental disease—especially the cause of schizophrenia.

Dental Research

Three million dollars would be appropriated to the University of Minnesota School of Dentistry for research in tooth decay, gum and bone disease, major developmental mouth defects, establishment of oral health programs for schools and the development of a more efficient delivery system of dental health care for senior citizens.

Health Care Delivery Research

Recommendation that one million dollars be appropriated to create a Health Services Research Center at the University of Minnesota to provide information, analysis, and technical support to health planners and state agencies on health costs, productivity, regulation and organization. This new Center would receive direction from the statewide Health Coordinating Council and be assisted in the development of health statistics from a new commitment to the State Center for Health Statistics of $250,000 for additional work in this area.

Other Health Proposals

Appropriation of $23 million dollars for the Department of Public Welfare for the full funding of the Catastrophic Health Insurance Program established by the 1976 Legislature.

Emphasis was given to Minnesota's first Governor's conference on medical care systems for the emergency patient scheduled for February 24 and 25, 1977.*

Nursing Scholarships

Three hundred and ten thousand dollars recommended for nursing scholarships and that the fund be transferred to the Higher Education Coordinating Board.

Mayo Medical School

Recommendation that a graduate residency program be established at Mayo similar to the one at the University of Minnesota.

For the complete text of the Governor's message on any aspect of health, please address your request to:

Minnesota State Medical Association
Division of Socio-Economic Affairs
101 East Fifth Street, #900
St. Paul, MN 55101

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*MSMA President, Richard E. Anonsen, M.D. and Stanley R. Maxeiner, Jr., M.D. are scheduled to appear on the program of the Governor's conference.

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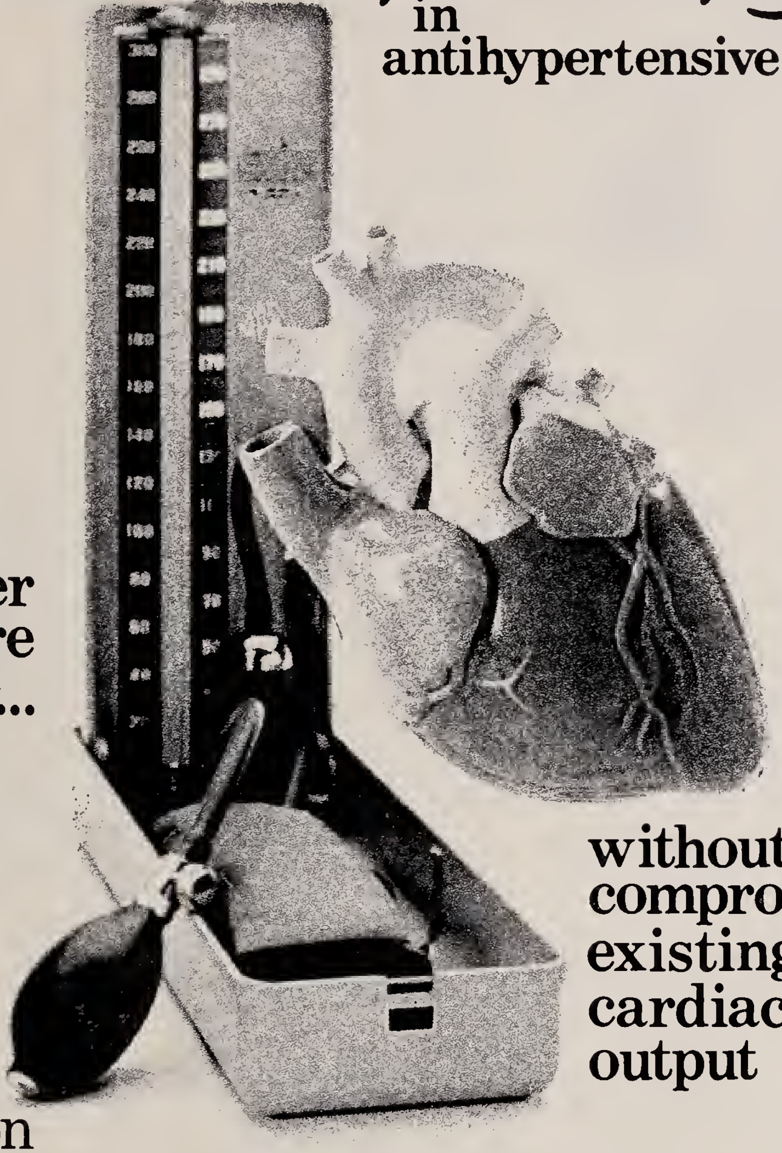

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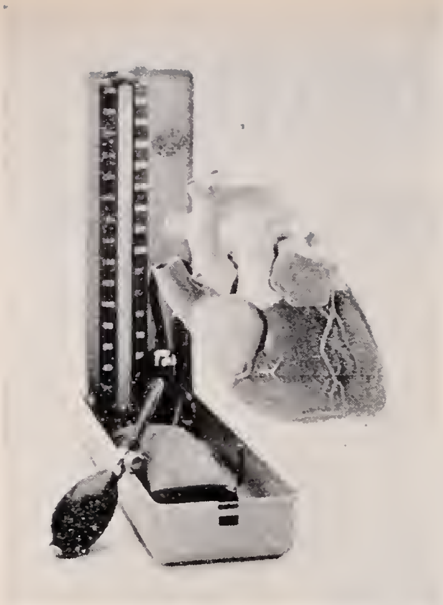

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Warnings: It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. Read this section carefully to understand these reactions.

With prolonged methyldopa therapy, 10% to 20% of patients develop a positive direct Coombs test, usually between 6 and 12 months of therapy. Lowest incidence is at daily dosage of 1 g or less. This on rare occasions may be associated with hemolytic anemia, which could lead to potentially fatal complications. One cannot predict which patients with a positive direct Coombs test may develop hemolytic anemia. Prior existence or development of a positive direct Coombs test is not in itself a contraindication to use of methyldopa. If a positive Coombs test develops during methyldopa therapy, determine whether hemolytic anemia exists and whether the positive Coombs test may be a problem. For example, in addition to a positive direct Coombs test there is less often a positive indirect Coombs test which may interfere with cross matching of blood.

At the start of methyldopa therapy, it is desirable to do a blood count (hematocrit, hemoglobin, or red cell count) for a baseline or to establish whether there is anemia. Periodic blood counts should be done during therapy to detect hemolytic anemia. It may be useful to do a direct Coombs test before therapy and at 6 and 12 months after the start of therapy. If Coombs-positive hemolytic anemia occurs, the cause may be methyldopa and the drug should be discontinued. Usually the anemia remits promptly. If not, corticosteroids may be given and other causes of anemia should be considered. If the hemolytic anemia is related to methyldopa, the drug should not be reinstituted. When methyldopa causes Coombs positivity alone or with hemolytic anemia, the red cell is usually coated with gamma globulin of the IgG (gamma G) class only. The positive Coombs test may not revert to normal until weeks to months after methyldopa is stopped.

Should the need for transfusion arise in a patient receiving methyldopa, both a direct and an indirect Coombs test should be performed on his blood. In the absence of hemolytic anemia, usually only the direct Coombs test will be positive. A positive direct Coombs test alone will not interfere with typing or cross matching. If the indirect Coombs test is also positive, problems may arise in the major cross match and the assistance of a hematologist or transfusion expert will be needed.

Fever has occurred within first 3 weeks of therapy, sometimes with eosinophilia or abnormalities in liver function tests, such as serum alkaline phosphatase, serum transaminases (SGOT, SGPT), bilirubin, cephalin cholesterol flocculation, prothrombin time, and bromsulphalein retention. Jaundice, with or without fever, may occur, with onset usually in the first 2 to 3 months of therapy. In some patients the findings are consistent with those of cholestasis. Rarely fatal hepatic necrosis has been reported. These hepatic changes may represent hypersensitivity reactions; periodic determination of hepatic function should be done particularly during the first 6 to 12 weeks of therapy or whenever an unexplained fever occurs. If fever and abnormalities in liver function tests or jaundice appear, stop therapy with methyldopa. If caused by methyldopa, the temperature and abnormalities in liver function characteristically have reverted to normal when the drug was discontinued. Methyldopa should not be reinstituted in such patients.

Rarely, a reversible reduction of the white blood cell count with primary effect on granulocytes has been seen. Reversible thrombocytopenia has occurred rarely. When used with other antihypertensive drugs, potentiation of antihypertensive effect may occur. Patients should be followed carefully to detect side reactions or unusual manifestations of drug idiosyncrasy.

Use in Pregnancy: Use of any drug in women who are or may become pregnant requires that anticipated benefits be weighed against possible risks; possibility of fetal injury can not be excluded.

Precautions: Should be used with caution in patients with history of previous liver disease or dysfunction (see Warnings). May interfere with measurement of: uric acid by the phosphotungstate method, creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, falsely high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. It is important to recognize this phenomenon before a patient with a possible pheochromocytoma is subjected to surgery. Methyldopa is not recommended for patients with pheochromocytoma. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites.

Stop drug if involuntary choreoathetotic movement occur in patients with severe bilateral cerebrovasc lar disease. Patients may require reduced doses anesthetics; hypotension occurring during ane thesia usually can be controlled with vasopressor Hypertension has recurred after dialysis in patient on methyldopa because the drug is removed by th procedure.

Adverse Reactions: *Central nervous syster* Sedation, headache, asthenia or weakness, usual early and transient; dizziness, lightheadednes symptoms of cerebrovascular insufficienc paresthesias, parkinsonism, Bell's palsy, decrease mental acuity, involuntary choreoathetotic mov ments; psychic disturbances, including nightmar and reversible mild psychoses or depression.

Cardiovascular: Bradycardia, aggravation of angi pectoris. Orthostatic hypotension (decrease da dosage). Edema (and weight gain) usually reliev by use of a diuretic. (Discontinue methyldopa edema progresses or signs of heart failure appea

Gastrointestinal: Nausea, vomiting, distention, co stipation, flatus, diarrhea, mild dryness of mouth, so or "black" tongue, pancreatitis, sialadenitis.

Hepatic: Abnormal liver function tests, jaundic liver disorders.

Hematologic: Positive Coombs test, hemolyt anemia. Leukopenia, granulocytopenia, thror bocytopenia.

Allergic: Drug-related fever, myocarditis.

Other: Nasal stuffiness, rise in BUN, breast enlarg ment, gynecomastia, lactation, impotence, decreas libido, dermatologic reactions including eczema a lichenoid eruptions, mild arthralgia, myalgia.

Note: Initial adult dosage should be limited 500 mg daily when given with antihypertensiv other than thiazides. Tolerance may occur, usua between second and third month of therapy; i creased dosage or adding a thiazide frequen restores effective control. Patients with impair renal function may respond to smaller doses. Sy cope in older patients may be related to increas sensitivity and advanced arteriosclerotic vascul disease; this may be avoided by lower doses.

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Black Bottom

A Sign of Retroperitoneal Bleeding

ARNOLD P. KAPLAN, M.D.,* DAVID C. BROWN, M.D.* and
JERROLD LARSON, M.D.*†

Perianal ecchymosis may be a sign of retroperitoneal hemorrhage. Two patients with this association are reported; one of whom also had Grey Turner's and Cullen's signs. The pathogenesis of perianal ecchymosis is discussed.

ALTHOUGH FLANK DISCOLORATION is well known as a sign of retroperitoneal hemorrhage, perianal ecchymosis has received scant attention.[1-3] We have recently seen the association of retroperitoneal hemorrhage and such ecchymosis in two patients. In one, early recognition of this sign would have indicated surgery that could have prevented the fatal outcome.

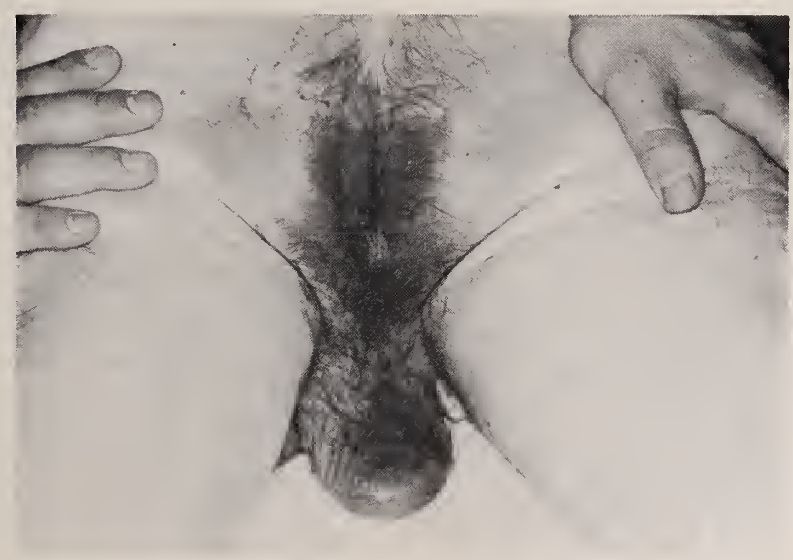
Case Reports

Case 1

A 73-year-old man was referred to the hospital with a history of melena and oliguria. The referring physician had noted a left lower quadrant abdominal mass and a hemoglobin concentration of 5 gm per 100 ml. On admission the patient was confused but comfortable and responsive. His blood pressure was 110/60 while supine and undetectable when sitting. His abdomen was distended, and a surgical scar extended from xyphoid to pubis. There was a vague, nontender, nonpulsatile, suprapubic mass and an ecchymosis of the perianal skin which extended anteriorly to involve the scrotum. During the initial examination the patient became unresponsive, apneic and pulseless. Rapid infusion of saline and Dextran, as well as cardiopulmonary resuscitation, was unsuccessful.

Further history, unavailable premortem, was that five years previously he had undergone replacement of an asymptomatic aneurysm of the aorta and common iliac arteries with a teflon bifurcation graft. The postoperative course had been uneventful, and followup examinations were unremarkable.

At autopsy, the peritoneal cavity contained 1600 ml of blood and clots. The retroperitoneal space and small



Figure—Perineal area in Case 1.

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bowel mesentery were extensively infiltrated by hemorrhage; the mesosigmoid was most markedly involved and the sigmoid colon was infarcted. Blood had also entered the pararectal tissues and had dissected inferiorly. The aorta was markedly atherosclerotic above the teflon graft which extended from immediately below the renal arteries to the bifurcation of the common iliac arteries. The prosthesis and suture lines appeared intact, but just distally there was an aneurysm of the right common iliac artery with an anteromedial rupture site measuring 2.5 by 1.5 cm. The perineum and scrotum revealed the blue-black ecchymosis noted clinically (Figure).

Case 2

A 69-year-old white male, developed chills, fever and signs of right lower lobe pneumonia while hospitalized on the psychiatry service. He was transferred to the medical service and treated with antibiotics. His course was characterized by fever, episodes of confusion, oliguria and progressive azotemia. Five days after transfer, a left pleural effusion appeared. The diagnosis of pulmonary infarction was made, and treatment with intravenous heparin was given for the following three days. The hemoglobin concentration decreased from 11.0 gm per 100 ml. to 4.0 over five days, during which time several stool specimens were negative for occult blood. Ten days after transfer, ecchymoses of the flanks, umbilicus and perianal area were noted. An intravenous pyelogram at this time disclosed medial deviation of the right ureter, suggesting a retroperitoneal mass. The patient improved temporarily with blood transfusions and supportive therapy, but two weeks later he died after several hours of restlessness and confusion.

Autopsy revealed a large gelatinous retroperitoneal hematoma surrounding the right kidney and extending downward involving the right ureter and pelvic colon. The site of bleeding was not found. Ecchymoses of the perineum and flanks as well as of several smaller areas on the extremities were seen. There was no evidence of pulmonary embolism, and death was attributed to pneumonia with septicemia.

Discussion

Although perineal dissections were not performed, the postmortem appearance of the pelvis in each case suggests a reasonable explanation for the distribution of the ecchymoses. Retroperitoneal blood dissected along the rectum in the weak pararectal fascia, and penetrated the point of attachment of the rectum to the levator ani muscle, the only substantial barrier to caudal spread.[4] Once beyond the levator, blood continued downward in the perirectal fascial plane to emerge subcutaneously in and around the fibers of the subcutaneous portion of the external anal sphincter. The blood appears to have continued anteriorly into the superficial tissue of the scrotum, leaving the perineal body unstained. The triangular shape of the perineal mark suggests that lateral spread of blood was limited by the underlying structures of the urogenital triangle.

The diagnostic implications of the flank ecchymoses of Grey Turner[5] and the anterior bruising of Hofstätter and Cullen[6] have been long recognized. Retroperitoneal bleeding has also been recognized as the cause of ecchymoses of the penis,[7] the scrotum,[8,9] and near the knee at the distal end of the adductor canal.[9] Perineal discoloration is usually thought of as a sign of pelvic or genital trauma.[10] Its association with retroperitoneal bleeding has been recorded by Beebe, Powers and Ginoures[3] and emphasized by Tamvakopoulos, Corvese and Vargas.[1,2] These latter authors reported three patients who had ruptured aortic aneurysms. Blood had entered the sigmoid mesocolon and dissected into the pelvis between the levator ani to cause a perianal stain.

Our two cases add to those previously reported in the literature. In addition, the combination of perianal, flank and umbilical ecchymoses in our second patient demonstrates the common origin of "black bottom," Grey Turner's and Cullen's signs.

References

1. Tamvakopoulos SK, Corvese WP and Vargas LL: Perianal hematoma—a sign of leakage after rupture of aortic aneurysm. New Engl J Med 280:548, 1969.
2. Tamvakopoulos SK, Corvese WP and Vargas LL: Perianal ecchymosis as a clinical sign: manifestation of rupture of an aneurysm into the sigmoid mesocolon. Arch Surg 99:612, 1969.
3. Beebe RT, Powers SR, Jr and Ginoures E: The early diagnosis of ruptured abdominal aneurysm. Ann Int Med 48:834, 1958.
4. Hollinshead WH: Anatomy for Surgeons: Volume 2. The thorax, abdomen and pelvis. New York: Paul B. Hoeber, Inc., 1956.
5. Turner GG: Local discoloration of the abdominal wall as a sign of acute pancreatitis. Brit J Surg 7:394, 1919.
6. Fallon J and Manning JJ: A variant of the Hofstatter-Cullen sign in intra-abdominal hemorrhage from ectopic pregnancy with a note on the mechanism of its production. New Engl J Med 240:747, 1949.
7. Pearlman SJ: Ruptured aortic aneurysm, simulating renal tumor. Amer J Surg 49:518, 1940.
8. Barratt-Boyes BG: Symptomatology and prognosis of abdominal aortic aneurysm. Lancet 2:716, 1957.
9. Rob CG and Williams JP: The diagnosis of aneurysms of the abdominal aorta (an analysis of 100 patients). J Cardiov Surg 1:55, 1960.
10. Bailey H: Demonstrations of physical signs in clinical surgery. Baltimore: The Williams and Wilkins Company, p 567; 1960.

Detection of Factitious Fever

Use of the Electronic Thermometer

DALE N. GERDING, M.D.;* PETER A. R. MENGE, M.D.;† and
WENDELL H. HALL, M.D.*

Factitious fever is a rare but consistent cause of fever of unknown origin. Most falsifications of temperature are due to manipulations of the traditional mercury thermometer. In this case an electronic thermometer which can rapidly determine body temperature at the bedside was used to detect factitious fever. The routine use of this increasingly available device in cases of suspected temperature falsification is recommended.

THE DIFFERENTIAL DIAGNOSIS of fever of unknown origin (FUO) must always include the possibility of deception by the patient who factitiously alters his temperature.[1,2] The rare patient with factitious fever presents a difficult diagnostic challenge for the physician.[3] False temperature elevations are often achieved by manipulations or exchanges of traditional mercury thermometers.[3-5] The electronic thermometer can determine temperature rapidly in the presence of an observer and is readily available in a large number of hospitals.[6,7] We have recently used this instrument to detect a case of suspected factitious prolongation of fever.

Case Report

A 20-year-old female student nurse was seen as an outpatient on January 13, 1975 with a complaint of sore throat, hoarseness and fever. Temperature was 38.9 C (102 F) (mercury thermometer) and the pharynx was inflamed. The patient was empirically treated with erythromycin and aspirin for possible streptococcal pharyngitis, pending results of throat culture. Throat culture was negative for β-hemolytic streptococci, but the patient returned several days later with painful, swollen wrists and ankles and an urticarial eruption over the knees and elbows. Erythromycin was discontinued and joint symptoms and rash resolved, though fever persisted.

Because of the fever she was hospitalized on February 10, 1975. Initial physical examination revealed a young, healthy-appearing white female in no acute distress. Temperature was 38.9 C (102 F) (mercury thermometer) orally, pulse 112 and blood pressure 136/86 mm Hg. Physical findings were entirely normal except for an apparent healed granuloma in the left fundus and a Grade I/VI ejection cardiac murmur at the left sternal border.

Laboratory studies showed hemoglobin values of 11.9 to 12.6 gm/100 ml; leukocyte count of 6,700/cu mm, 71% neutrophils, 24% lymphocytes and 5% monocytes. Urinalysis was normal. Erythrocyte sedimentation rate was repeatedly less than 5 mm/hr. Anti-streptolysin O titer was normal as were the fluorescent antinuclear antibody, lupus erythematosus preparation and slide agglutination test for mononucleosis. Cold agglutinins were less than 1:16. Multiple determinations for bilirubin, alkaline phosphatase, serum glutamic-oxalacetic transaminase, blood urea nitrogen and calcium were normal. Skull and chest Xrays were normal. Barium contrast Xrays of the upper gastrointestinal tract and colon were normal.

Skin tests for tuberculosis and histoplasmosis were negative. Urine culture and nine blood cultures were sterile. Repeat throat culture showed no pathogenic organisms. Acute and convalescent serum titers for adenovirus and cytomegalovirus were negative. Bone scan was normal. Lymphangiogram showed large femoral and inguinal lymph nodes without filling defects. Bone marrow biopsy and aspiration showed moderate lymphocytosis and decreased iron stores but was nondiagnostic. Needle biopsy of the liver was normal.

Diagnostic laparotomy was being considered when it was noted that the patient's temperature was consistently at the same level of 38.9 C (102 F) despite administration of aspirin and acetaminophen. During recorded temperature elevations the patient did not feel warm or appear febrile. Several temperature determinations were observed by a nurse but no suspicious activity was noted. Nevertheless, manipulation of the mercury thermometer was suspected, and temperatures were, therefore, taken with an electronic thermometer. All subsequent temperatures were normal. The exact method of temperature falsification was not discovered but exchanging of mercury thermometers was suspected because of the consistent level of temperature elevation.

---

*Infectious Disease Section, Department of Medicine, Veterans Administration Hospital, and University of Minnesota Medical School.

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Reprint requests to Veterans Administration Hospital, 54th St. and 48th Ave. South, Minneapolis, Minnesota 55417, (Dr. Gerding).

It was later determined that the patient was having difficulty adjusting to nursing school and had a previous history of hysterical paralysis of the right arm following an automobile accident. When confronted with the possibility of factitious fever the patient offered no explanation. Psychiatric counseling was recommended.

Comment

This patient was initially felt to have a possible viral pharyngitis complicated by an allergic reaction to erythromycin. This antecedent history of apparently bona fide illness is not uncommon in cases of factitious fever[3,5] and is often responsible for a failure to consider this diagnosis. As has previously been emphasized by Petersdorf and Bennett,[3] patients with factitious fever are often young females who are medically knowledgeable. They point out four clues to the diagnosis; (a) failure of the temperature to follow the normal diurnal variation; (b) absence of tachycardia in the face of abrupt spikes in temperature; (c) strikingly rapid defervescence unaccompanied by sweating; and (d) presence of fever of 106 F or higher, a relatively rare phenomenon in adults. The first three criteria were met by this patient, although on initial examination the pulse was elevated in proportion to the temperature. An additional factor that aroused suspicion in this case was the consistent level of temperature elevation in spite of antipyretics, coupled with the findings of normal sedimentation rate, leukocyte count and hemoglobin.

A variety of maneuvers have been employed by patients to falsify temperature. In general they can be divided into two types: (a) manipulations or substitutions of the mercury thermometer and (b) ingestion or injection of pyrogenic substances. The former method includes holding the thermometer next to a hot water bottle, steam pipe, radiator, light bulb or flame; shaking in retrograde fashion; producing friction by rubbing on bedclothes or manipulating tongue, gums, teeth or anal sphincter; and substituting pre-set thermometers for the one distributed by the nurse.[3] The pyrogenic substances injected have included vaccines, toxoids, drugs and bacteria.[3,8] Fever in such cases is bona fide, though produced by fraudulent means, and is a much rarer cause of factitious fever.

Electronic thermometers used for periodic measurement of temperature consist of a temperature sensing probe and a portable, battery powered, readout device.[7] Temperature is read from a meter or digital display. The person obtaining the temperature remains at the bedside holding the probe in place until thermal equilibration takes place (usually less than one minute) or until the actual temperature is "predicted" from sampling the rate of rise of temperature over a brief time period. The latter thermometers give body temperature readings in about 15 seconds. Electronic thermometers have been advocated over mercury thermometers because of claims of greater accuracy, ease of use, conservation of time, safety, reduction of infection and decreased cost.[6] Whether any of these arguments justify their routine use in hospitals remains controversial,[6] however, the value of this instrument to detect or "rule out" factitious fever due to manipulations of the mercury thermometer should be emphasized. The rapidity of recording in the presence of an observer, using an instrument not generally accessible to patients, should detect falsification of fever in most patients. Obviously, the use of fraudulent means such as pyrogenic injections to produce bona fide temperature elevations will not be detected by this device.

In this case use of an electronic thermometer averted a contemplated diagnostic laparotomy. Its use, however, did not result in a disclosure of the means by which the temperature elevation was produced. When confronted with evidence of temperature falsification, patients frequently deny the evidence and discharge themselves from the hospital.[3] Although this eliminates the immediate problem for the physician, it is not productive in providing the ongoing care required by the patient. The early collaboration of a psychiatric consultant when temperature falsification is suspected has been recommended.[4] Hopefully, the underlying causes of malingering can be determined in this way, and the patient provided with follow-up care that will prevent a repetition of this behavior.

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Disk-Space Infection

Localization with Gallium 67

JOHN H. MILLER, M.D.,* HEINZ W. WAHNER, M.D.† and
WILLIAM E. WELLMAN, M.D.‡

^{67}Gallium is finding increasing use as a scanning agent for the localization of occult inflammatory processes. Its use in the localization of a disk-space infection is reported, with some discussion of the technical factors necessary for adequate interpretation.

RADIOISOTOPE SCANNING with ^{67}Ga for the localization of inflammatory tissue and abscesses has experienced a resurgence of interest. The early diagnosis of deep-seated infections remains a difficult diagnostic problem despite the many noninvasive and invasive radiographic procedures available. Because of this need, attention has been directed to evaluate the ^{67}Ga scan as an additional diagnostic tool. The present report concerns a patient in whom a disk-space infection in the lumbar spinal column was detected by a gallium scan even though the roentgenogram showed no abnormality.

Case Report

This 61-year-old white housewife was hospitalized because she had severe back pain for three days. She had associated leg pain, abdominal pain, and constipation. The patient said that this attack was similar to previous attacks of diverticulitis.

Examination revealed a temperature of 104°F (40°C), with tenderness over the entire lower abdomen but more severe on the left. Tenderness also was noted over the lower back; but there were no muscle spasms, and straight leg raising was normal.

Results of routine blood studies were normal. Three blood cultures on the day of admission were positive for *Staphylococcus aureus*, which was inhibited by 0.09 μg/ml of penicillin, with complete killing by 1.56 μg/ml. Roentgenograms of the abdomen showed a distended bowel consistent with an adynamic ileus. The initial roentgenogram of the lumbar region showed slight degenerative changes (Figure 1). Because of the pain in the lower back and the positive blood cultures, a disk-space infection was suspected and a scan with ^{67}Ga was performed.

The patient was given three mCi of gallium citrate (Diagnostic Isotopes, Upper Saddle River, NJ) intravenously. The next day, cleansing enemas and laxatives were given. The scans were performed 24 and 48 hours

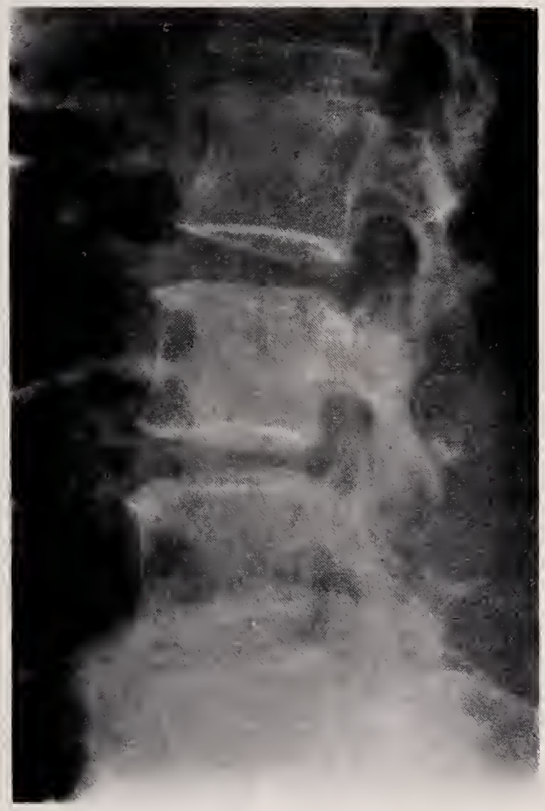

Fig. 1—(A) Lateral view of lumbar spinal column at time of admission, showing hypertrophic changes.

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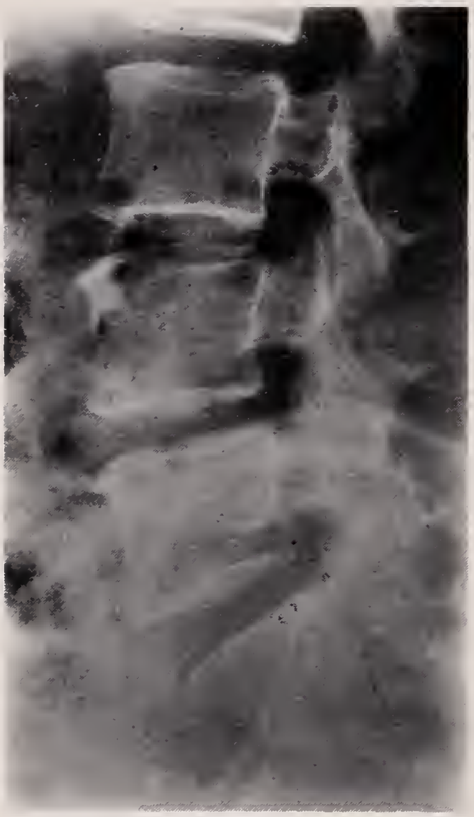

Fig. 1—(B) One week after admission, with some slight narrowing of third lumbar interspace.

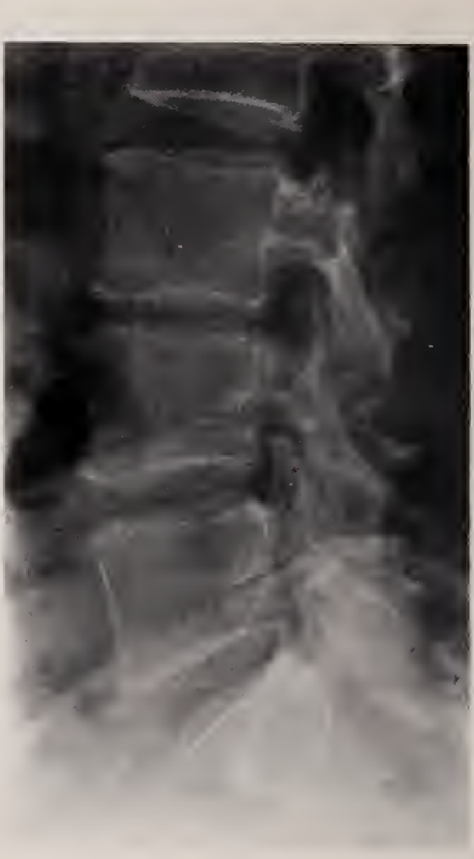

Fig. 1—(C) One month after admission, confirming diagnosis of disk infection in third lumbar interspace.

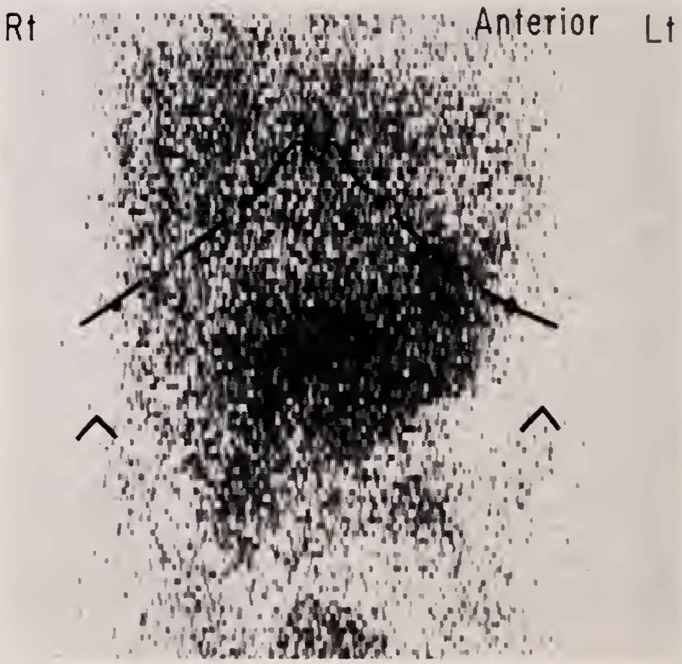

Fig. 2—(A) ^{67}Ga scan. (A) Anterior view of abdomen. Accumulation of isotope in liver, pelvis, and region of spleen reflects normal distribution. Accumulation of gallium in midabdomen may represent uptake by spinal abscess but cannot be distinguished from ^{67}Ga in intestinal tract.

later (General Electric five-inch Dual Probe Scanner, with a VC3 low-energy coarse collimator). The pulse height analyzer setting had a 40 keV window centered at 93 keV. Anterior, posterior, and lateral scans were performed. The gallium scan showed abnormal uptake in the lumbar spine in the region of the pain and supported the diagnosis of a disk-space infection (Figure 2).

After the scan, penicillin was given intravenously in doses of 20 million units daily, starting the day after admission and continuing over the next eight weeks. The temperature returned to normal after one week, and the abdominal pain gradually disappeared over a period of two weeks. The back pain resolved more slowly and was still present but of much less intensity at dismissal. A letter from the patient one month later indicated significantly less pain and improvement in her walking ability and general health.

Discussion

The potential usefulness of gallium citrate (^{67}Ga) as a scanning agent for localizing inflammatory processes that are not detectable with currently available noninvasive roentgenography has been recognized only recently.[1-4] Scans using ^{67}Ga have been described as being useful in the diagnoses of intra-abdominal abscesses in humans[1] and animals,[2] of a nontuberculous psoas abscess,[4] of extra-abdominal infections, including osteomyelitis of the spinal column,[1] of liver abscesses,[5] and of gall bladder empyema.[6]

The mechanisms involved in the accumulation of ^{67}Ga are not understood completely. Blair

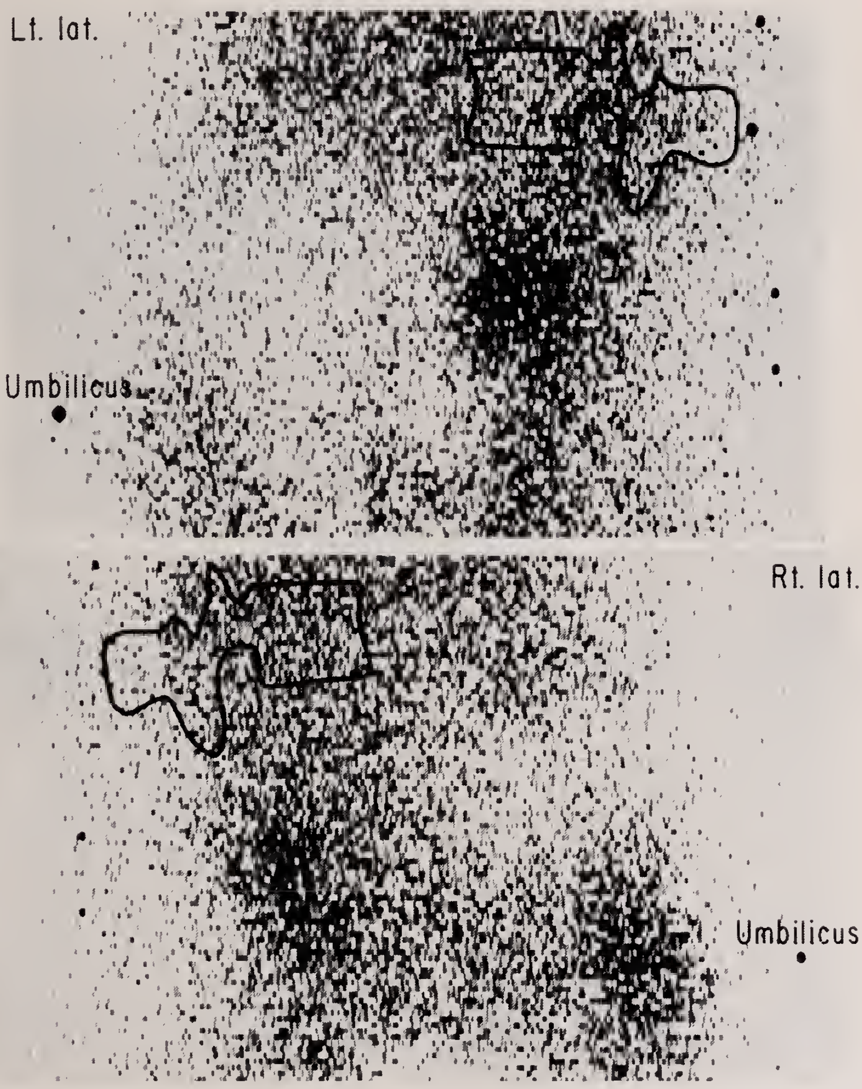

Fig. 2—(B-top) and (C-bottom) Lateral views of abdomen. Gallium accumulation in region of third lumbar interspace. No gallium localization in the intestines anteriorly, indicating that the gallium accumulation seen in anterior view was due to disk-space abscess.

and associates,[1] in their experimental work in animals and a review of the literature, suggested that, after intravenous injection, protein complexes involving gallium form in the blood, which are then transported to specific tissues and bound to them. Binding may occur by the dissociation of the plasma protein complexes and the subsequent rebinding of gallium to extracellular proteins. This complex mechanism and our inability to control all the factors involved may explain the occasional normal scan in the presence of an abscess or the occasional uptake by tissue other than abscesses or tumors.

Our case demonstrated that a ^{67}Ga scan also can be useful for the early diagnosis of a disk-space infection when roentgenography is unable to detect an abnormality. The anterior scan is difficult to interpret because of the biliary excretion of the isotope, which may lead to pooling in the intestines. This problem is well recognized with the use of gallium in patients who have abdominal lymphoma. In patients with spinal disease, however, a lateral scan is helpful because, in this position, gallium in the intestinal tract can easily be identified and be differentiated from uptake in the spinal column.

Our case demonstrates that a gallium scan *may* be useful in patients in whom an *infectious* process in a disk space is suspected clinically but whose roentgenogram does not support the diagnosis.

References

1. Blair DC, Carroll M, Silva J, et al.: Localization of infectious processes with gallium citrate Ga^{67}. JAMA 230:82, 1974.
2. Silva J Jr, Harvey WC: Detection of infections with gallium-67 and scintigraphic imaging. J Infect Dis 130:125, 1974.
3. Harvey WC, Silva J, Haines RS Jr: Detection and delineation of abdominal abscesses in rabbits with ^{67}Ga. Radiology 107: 681, 1973.
4. Fratkin MJ, Sharpe AR Jr: Nontuberculous psoas abscess: localization using ^{67}Ga. J Nucl Med 14:449, 1973.
5. Lomas F, Dibos PE, Wagner HN Jr: Increased specificity of liver scanning with the use of ^{67}gallium citrate. N Engl J Med 286:1323, 1972.
6. Lomas F, Wagner HN Jr: Accumulation of ionic ^{67}Ga in empyema of the gallbladder. Radiology 105:689, 1972.

Cover Painting

"The Three Physicians"

Dr. Charles D. Ray, Vice President of Neurological Research, at Medtronic in Minneapolis, painted the cover artwork. He gave the Editors the following explanation of the painting:

"The Three Physicians—Acrylic on canvas board 18″ x 30″. In part, a collage of materials consisting of crushed marble, a journal photograph, a piece of woven burlap, a polished Apache tear, and sculpture medium. Depicted the three principal phases of medicine consisting of (left to right): the diagnostician with a stethoscope around his neck, a chest film in his right hand, a diagnostic mirror attached to a band on his head, and a far-away look on his face. The central figure is a surgeon who stands, somewhat aggressively, with a very large, gloved hand holding a bright, oversized scalpel; the mask over his face hides a deeper look inside. The third figure is a basic scientist whose cloak is classical Greek and heavily folded. He holds the snake of Aesculapius tightly in both hands and, quite unlike the diagnostician, appears to have a more ethereal appearance on his face. Faintly visible is a laurel wreath of higher education on his otherwise bald pate. The painting is heavily textured and rather dimensional."

Thyrotoxicosis as a Cause of Psychosis

GREG PEHLING, B.A.* and JOHN N. MORK, M.D.†

A 26-year-old male patient presenting with thyrotoxicosis and hypomania is reported. The wide range of psychiatric symptoms reported in thyrotoxicosis and the roles played by the catecholamines and brain electrolytes in their pathogenesis are discussed. Although thyrotoxicosis is rarely found in groups of psychiatric patients, the importance of detecting a curable endocrine disorder among such patients deserves emphasis.

THE ASSOCIATION OF PSYCHIATRIC disturbances with thyrotoxicosis has long been recognized. The most common clinical picture includes anxiety, hyperexcitability and hyperactivity. We describe a patient with thyrotoxicosis and a psychotic reaction; the importance of recognizing a specifically curable cause of a psychiatric disturbance is emphasized.

Case Report

A 26-year-old-white-male truck driver telephoned the clinic on the morning of 1-4-76, demanding to see a doctor. His language was described as profane and his demand obnoxious. This was the fourth doctor's office he had called that day.

His chief complaint was weakness. He had lost 60 pounds since July, 1975. During that time he had mild insomnia, became increasingly intolerant to heat and lost strength. Palpitations and diarrhea were noted. His increasing weakness resulted in his inability to perform on par with his co-workers. The patient stated that his desire for and ability to perform sexual intercourse had increased. Both the patient and his wife had noticed his markedly increased excitability and decreased temper threshold. He was aware of a problem of raising his voice when angry or excited although he denied any violence. His wife confided that he talked almost constantly.

Physical examination revealed a tall, agitated young man, wearing only undershorts. He was oriented to time, place and person, and talked constantly and animatedly. His temperature was 99.0° F.; his pulse was 123/min. and regular, and his weight was 187 pounds. His skin was warm and moist and he had a fine resting tremor. His face was somewhat flushed. He demonstrated slight lid lag but no exophthalmos. The thyroid gland was diffusely enlarged to approximately 50 gms.; it was nontender and had a systolic bruit. The heart had a regular rhythm with no murmurs, but there was a clearly audible abdominal aortic bruit. Reflexes were hyperactive and symmetrical. The biceps and quadriceps muscles showed diminished strength.

EKG showed a sinus tachycardia. Thyroid ^{131}I uptake was 51% at four hours and 65% at 24 hours. T3 resin uptake was 49% (normal 22-35%) and T4 by RIA was 21.9 ug/dl (normal 4.0-11.5). Alkaline phosphatase was 92 IU, (normal 25-80 IU), total bilirubin 3.0 mg %, and cholesterol 90 mg %. The following lab values were within normal limits: ESR, Hgb., Hct., urinalysis, serum creatinine, BUN, uric acid, serum calcium, blood glucose, serum LDH and SGOT, total protein, triglycerides and chest Xray.

Treatment was begun with propranolol 40 mg q.i.d. On the second hospital day phenobarbital was added to subdue the patient's agitation and temper. The next day he was taking phenobarbital 60 mg t.i.d. propranolol 60 mg q.i.d., and methimazole 40 mg q.8 h.

The patient was hospitalized four days. Several hours after starting medication his pulse had dropped to 86/min. It remained in the 80-95/min. range until discharge. For the first two days the patient's most noteworthy features were his pressure of speech and loosening of association. When visited he would invariably follow the physician out of the room talking. The content of his speech included detailed complaints about the restrictive nursing staff, elaborate descriptions of his past history, demands for a vasectomy, and railing at the liberal political elements. One topic led to another without transition.

Certain features of the content of his speech were remarkable. First was his paranoia. He complained about the nurses' refusal to allow his immediate access to his doctor's attention. He suspected the nursing staff of attempting to subvert his care. His statements regarding his employment situation were infused with anger, frustration, and the suspicion that his co-workers thought ill of him because of his weakness. Secondly, the patient insisted on having his own way. Despite outbursts of temper, he was not violent and repeatedly stated that he would cooperate fully so long as he was promptly made well.

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Coupled with his incessant talking was the patient's hyperactivity. During the first 48 hours of his hospitalization he frequently appeared clad only in his undershorts. It was in this same attire, contrary to the nurses' insistence, that he walked down the hall to the shower. Although still agitated on the fourth hospital day, he maintained that he would fully cooperate with the doctor's plans if allowed to go home. His wife was given specific instructions regarding home care and the patient was discharged.

After discharge, the patient took tapering doses of methimazole for six months. Propranolol and phenobarbital were tapered for three weeks and then discontinued. Six months after discharge the patient was euthyroid, subdued and his excitability completely controlled. He had gained more than 40 pounds, had regained his strength, and was working full time.

Discussion

A wide range of psychiatric disturbances have been documented in thyrotoxic patients. The most common emotional picture seen is that consistent with the symptoms of hyperthyroidism namely "hyperexcitability, irritability, restlessness, exaggerated responses to environmental stimuli, and emotional instability, . . ."[1] One objective study of a small group of non-psychiatric hyperthyroid patients revealed them to have both cognitive and affective disturbances.[2] In addition, although a "high level of anxiety was noticed in the hyperthyroid group, . . . no euphoria was present, and the hyperthyroid persons were not hypomanic in the general accepted psychiatric sense":[2] In contrast to this mild symptomatology, cases of hyperthyroidism are recorded in which a florid psychosis dominates the clinical picture.[4,6,12]

Screening Psychiatric Admissions (Incidence)

The incidence of thyrotoxicosis in groups of psychiatric patients is low. In one series of approximately 8,000 psychotic patients, only 10 had concurrent thyrotoxicosis by screening with a PBI.[3] Another study reveals that only one hyperthyroid patient was discovered per 1000 admissions to a large mental hospital.[4] That study's presentation of three cases of thyrotoxicosis "masquerading as" psychosis emphasizes the importance of finding a specifically curable endocrine disease in the psychotic patient.

Psychoses in Thyrotoxicosis

No psychotic picture is typical of thyrotoxicosis. Acute brain syndrome among these patients has been reported. Investigators writing in the 1930's when thyroid storm was common, found that of 143 cases of goiter accompanied by some degree of mental disturbance 38% had toxic exhaustion psychosis and 34% had acute delirium reaction.[5] These manifestations of thyrotoxicosis are, of course, rarely seen today.

Clinical pictures resembling schizophrenia including acute undifferentiated, paranoid, and catatonic types have been reported as accompanying thyrotoxicosis. Manic depressive psychosis, paranoid state, and involutional melancholia have also been noted as some of the more unusual accompaniments of thyrotoxicosis.[14,3] Regardless of the type of psychotic reaction, paranoid symptoms are often a prominent feature.[6]

Mechanisms of Production of Mental Disturbances

The precise nature of the relationship between thyrotoxicosis and the various mental phenomena cited is unknown. The disease has been characterized as a "metabolic disease manifested by impaired psychobiologic integration involving particularly the autonomic nervous system."[7] The sympathetic nervous system plays a role in the direct cause of palpitations, tachycardia, sweating, tremor, and hyperreflexia. A controlled study showed that these symptoms along with anxiety, agitation, and hyperkinesis are reduced in patients given a specific beta adrenergic blocking agent.[8] The decrease in our patient's heart rate and activity level after a day's treatment with propranolol certainly bears this out.

Although there is an increase in adrenergic activity in thyrotoxicosis, there is little evidence of increased catecholamine production, tissue sensitivity, or excretion.[9] In the brain, thyroid hormone many induce an increase in free epinephrine or norepinephrine just as it does in the heart. One report describes a thyrotoxic patient manifesting a severe psychosis whose mental state improved with 48 hours of treatment with propranolol and chlorpromazine.[6] Chlorpromazine acts to reduce the excitatory effect of norepinephrine on brainstem neurons and consequently increases their arousal threshold. Thus, this report again implicates central adrenergic hyperactivity in the etiology of mental disorders in thyrotoxicosis.[6]

Thyroid hormones also modify brain sodium concentration. This is of interest in regard to research of the pathogenesis of affective disorders. Shaw concludes that "affective disorders may be manifestations of altered brain excitability . . . produced by an abnormal distribution of sodium and potassium across neuronal membranes."[11] Thus, thyroid hormone induced brain electrolyte shifts may have a role in producing mental disturbances in thyrotoxicosis.

Gregory stresses the unique expression of anxiety, irritability, and emotional lability of each thyrotoxic patient is due to an exaggeration of previous personality characteristics . . .[12] In only a small percentage of thyrotoxic patients will "activation of latent trends . . . precipitate a frank functional psychosis, the form [depending] on the pre-psychotic personality."[12] In many of these latter cases the patient rendered euthyroid may require further psychiatric treatment.

More controversial is Lidz's view that patients who become thyrotoxic "have a single important interpersonal relationship and become ill [thyrotoxic] at the time of its disruption or threat of disruption . . ."[13] An opposing view is that the person who becomes thyrotoxic typically has no such psychological tension, and that the personality of a treated thyrotoxic patient closely resembles that of a normal person when measured using objective psychological tests.[7]

The patient presented had typical hypomanic symptoms of increased adrenergic activity. Pressure of speech and the hyperactivity, two elements in the classical triad of symptoms of hypomania, dominated the clinical picture.[14] The third element, euphoria, was present in retrospect when seen in a comparison of the post treatment and morbid personalities.

Paranoid features, as noted above, are not uncommon in many psychoses accompanying hyperthyroidism. Interestingly, the patient's view of his fellow workers and the nursing staff was infused with paranoia.

Treatment

The patient's immediate treatment, propranolol and phenobarbital, seemed to decrease the intensity of the mental symptoms while decreasing the peripheral thyrotoxic manifestation. A full reversal of the psychiatric symptoms did not occur until the excessive thyroid hormone production and release were controlled. This supports the theories of both adrenergic and direct thyroid hormone mediation of psychiatric symptoms in thyrotoxicosis.

References

1. Eayrs JT: Influence of the thyroid on the central nervous system. Brit Med Bull 16:122, 1960.
2. Whybrow PC, Prange AJ and Treadway CR: Mental changes accompanying thyroid gland dysfunction: a reappraisal using objective psychological measurement. Arch Gen Psych 20:48, 1961.
3. Bursten B: Psychoses associated with thyrotoxicosis. Arch Gen Psychiat 4:267, 1961.
4. Bluestone H: Hyperthyroidism masquerading as functional psychosis. Amer Practnr Dig Treat 8:557, 1957.
5. Dunlop HF and Moersch FP: Psychiatric manifestations associated with hyperthyroidism. Amer J Psychiatry 91:1215, 1935.
6. Greer S and Parsons V: Schizophrenia—like psychosis in thyroid crisis. Brit J Psychiat 114:1357, 1968.
7. Robbins LR and Vinson DB: Objective psychologic assessment of the thyrotoxic patient and response to treatment: preliminary report. J Clin Endocr 20:120, 1960.
8. Grossman W, Robin N1 et al.: Effects of beta blockade on the peripheral manifestations of thyrotoxicosis. Ann Int Med 74:875, 1971.
9. Levey GS: Catecholamine sensitivity, thyroid hormone and the heart: a re-evaluation. Am J Med 50:413, 1971.
10. Clower CG, Young AJ and Kepas D: Psychotic states resulting from disorders of thyroid function. Johns Hopkins Med J 124:305, 1969.
11. Shaw DM: Mineral metabolism, mania and melancholia. Br Med J 2:262, 1976.
12. Gregory I: Mental disorder associated with thyroid dysfunction. Canad MAJ 75:489, 1956.
13. Lidz R: Emotional factors: emotions and mentation, The Thyroid edited by S. C. Werner, New York, Hoeber-Harper, pp. 448-453, 1955.
14. Freedman AM, Kaplan H1 and Sadock BJ eds: Comprehensive Textbook of Psychiatry, 2nd ed. The Williams and Wilkin Co., 1975.

Detection of Factitious Fever—Gerding et al. (page 164.)

1. Petersdorf RG, Beeson P: Fever of unexplained origin: report on 100 cases. Medicine 40:1, 1961.
2. Jacoby GA, Swartz MN: Fever of undetermined origin. New Engl J Med 289:1407, 1973.
3. Petersdorf RG, Bennett IL Jr: Factitious fever. Ann Intern Med 46:1039, 1957.
4. Herzberg JH, Wolff SM: Chronic factitious fever in puberty and adolescence: a diagnostic challenge to the family physician. Psychiatry Med 3:205, 1972.
5. Thompson GW, Shuster J, Williams RL, Kaye M: Münchausen Syndrome: A cause of pyrexia of unknown origin. Can Med Assoc J 91:1021, 1964.
6. Mercury vs. electronic thermometers. Health Devices 2:3, 1972.
7. Clinical electronic thermometers. Health Devices 2:13, 1972.
8. Kuvin SF: Factitious fever of unusual origin. Lancet 2:809, 1962.

Biventricular Rupture and Death Secondary to Metastatic Adrenal Cortical Carcinoma

FREDERICK M. VINCENT, M.D.*† and WAYNE P. ANDERSON, M.D.*

A case is reported of a patient who died suddenly from biventricular cardiac rupture secondary to metastatic carcinoma from the adrenal gland. Some characteristics of this uncommon malignancy are reviewed.

THE PURPOSE OF THIS paper is to present the case report of a patient with adrenal cortical carcinoma and to briefly review the literature.

Case Report

A 70-year-old white man was admitted to the hospital with the primary complaint of lower abdominal discomfort of two days duration. On the day of admission he experienced severe sharp pain and pressure in the region of the urinary bladder that was accompanied by gross hematuria. Fatigue and weight loss had also been noted. Past medical history revealed cirrhosis presumably related to alcohol, complicated by bleeding esophageal varices and perforated gastric ulcer for which subtotal gastrectomy (Bilroth II) was performed.

Physical examination revealed a cachectic man who was alert and oriented. Vital signs were normal. There were no obvious signs of feminization or Cushings disease. A systolic ejection murmur was heard at the cardiac apex and base. The liver was enlarged with the edge palpated five cm below the right costal margin. No abdominal masses were palpable. The bladder was distended, but returned to normal size following catheterization. The rest of the physical examination was within normal limits.

Results of abnormal laboratory studies were as follows: Hemoglobin 9.9gm%, hematocrit 28.2%, white blood cell count 12,800 with 78% polys and 15% lymphs, platelet count 418,500, sedimentation rate (Westergreen) 64mm/hr, serum iron 20.6 mcg, serum iron binding capacity 287 mcg, total protein 6.6 gm%, albumin 3.0 gm%, cholesterol 120 mg%, blood urea nitrogen 37mg/100ml, alkaline phosphatase 25 K.A.U., lactic dehydrogenase 200 IU/ml, serum glutamic oxalatic transaminase 165 IU/ml, potassium 4.5 mEq/liter, sodium 138 mEq/liter, and prothrombin time 16.5 seconds with a control of 11 seconds. Urinalysis revealed many red and white blood cells, and subsequent culture grew out E.coli 100,000 colonies/cc. Chest roentgenogram revealed mild basilar pulmonary fibrosis and marked emphysema. Excretory urography demonstrated trabeculation of the bladder and bilateral hydronephrosis. A soft tissue density was evident superior to the right kidney, suggestive of a mass in that area. Transfemoral renal angiography demonstrated normal renal vasculature, and was not helpful in clarifying the right suprarenal mass. Upper gastrointestinal series revealed a retrogastric mass compressing the stomach to the left. Barium examination of the colon was negative. Liver scan was grossly abnormal and was consistent with massive replacement by tumor. Bone scan was negative.

The patient developed increasing cachexia and weakness during hospitalization, with episodes of flank pain, fever, nausea and vomiting. He expired suddenly the morning of his 48th hospital day.

Gross examination at necropsy revealed a liver weighing 1500 grams which was destroyed in its posterior aspect by a large cystic and necrotic hemorrhagic tumor measuring 13 x 12 cm. The right adrenal gland was also involved in the mass. The right kidney was encircled by the tumor mass, but no direct invasion was apparent. The left adrenal gland was replaced by a large lobular, necrotic, and hemorrhagic tumor, which was displacing the stomach to the left and anteriorly. This mass measured 18x10x5 cm. There was no evidence of normal adrenal tissue on the left, and it was felt that this was the site of the primary tumor. The pericardial sac contained 200 cc of blood. Two areas of myocardial rupture were evident. An area of 1.5 cm was present in the right ventricle with a verrucal mass extending from the area of rupture into the pericardial cavity. A similar area of perforation measuring 1.0 cm was present in the left ventricle. Considerable softening of the myocardium was noted around these two defects. The remainder of the heart was normal. The para-aortic lymph nodes were also involved with tumor, but no other organs were involved. Microscopic examination revealed an adrenal cortical carcinoma that was felt to have been primary in the left adrenal gland with subsequent metastases to the right adrenal gland, liver, heart, and para-aortic lymph nodes.

The immediate cause of death was most likely due to cardiac tamponade that resulted from the rupture of the myocardium in two sites, one in each ventricle, where metastatic lesions were found.

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Discussion

Carcinoma of the adrenal cortex is rare with a reported incidence of 0.2 cases per 100,000 population.[1] It represents less than 0.2 percent of all deaths from cancer.[2] The tumor can be classified as being functional (hormone producing) or non-functional, with the majority of cases being of the latter type. Whenever the adrenal malignancy has a hormonal behavior the diagnosis corresponds to the disturbance produced. The reported hormonal disturbances are Cushings disease, adrenogenital syndrome, and feminization.[3] Tumor manifestations may be obscure or may correspond to pressure from the tumor itself.[2] Usually these neoplasms are non-functional due to the intra tumoral enzymatic abnormalities such as the lack of 11 beta hydroxylation.[4] It has been proposed that a carcinoma is a functional one whenever it is possible to demonstrate abnormal steroid production by chemical determinations.[3] It is possible that the hormonal behavior of the tumor may change when it passes from the localized stage to the disseminated one.[4] There is a preponderance of functioning adrenal tumors in females, with a higher percentage of males with non-functioning neoplasms.[1] Adrenal cortical carcinomas may occur at any age, although one series reported the average age of females afflicted at 40 years, with the average age of males with the tumor being 50 years.[5]

The most common presenting symptoms are abdominal pain, weakness, weight loss, anorexia and vomiting, whereas the most common signs are the presence of an abdominal mass, distant lymphadenopathy, hepatomegaly, and leg edema.[5] Pyrexia is one of the earliest signs and may be secondary to necrosis of the tumor or secondary infection.[6] Adrenal cortical carcinoma has an early appearance of hematogenous metastasis most commonly to the lungs and liver, lymph nodes, and bone.[2,5] Spread to the opposite adrenal gland, brain, and kidney is less common.[5] Metastasis to the myocardium and to the pericardium is quite rate. There is no predilection for right or left side,[5] but when present on the right side hepatic extension is common.[1,5] The best available mode of therapy is surgery. The use of ortho para'DDD (o,p,'DDD), either in addition to surgery or as the only mode of therapy is not associated with a significantly longer survival.[5] However, Becker[7] recently reported on two living patients who have survived four and eight years following surgery and o,p,'DDD therapy for invasive adrenal cortical carcinoma. This good result suggests that the extensive excision of the tumor mass and early postoperative initiation of o,p,'DDD therapy may indeed produce prolonged survival.

Summary

The case of a patient with a primary adrenal cortical carcinoma with widespread metastases is reported. Although steroid levels were not determined, there was no clinical evidence that this tumor was functional. This case is unique because the immediate cause of death was rupture of both ventricles secondary to tumor implantation in the myocardium. Although there was wide dissemination of tumor, the lungs were completely free of involvement.

References

1. Hutter AM, Hayhoe DE: Adrenal cortical carcinoma. Clinical features of 138 patients. Amer J Med 41:572, 1966.
2. Ortiz-Quezada F et al.: Adrenal gland carcinoma. Report of two cases. J Urol 99:129, 1968.
3. Lipsett MB, Hertz R, Ross GT: Clinical and pathophysiologic aspects of adrenocortical carcinoma. Amer J Med 35:374, 1963.
4. Gallagher TF: On alterations in adrenal function, especially with adrenocortical carcinoma. Cancer Res 17:520, 1957.
5. Hajjar Ra, et al.: Adrenal cortical carcinoma. A study of 32 patients. Cancer 35:549, 1975.
6. Constantinou E: Nonfunctioning malignant tumor of the adrenal cortex. A case presentation. Arch Path 77:226, 1964.
7. Becker D, Schumacher OP: O,p, 'DDD therapy in invasive adrenocortical carcinoma. Ann Intern Med 82:677, 1975.

Continuing Medical Education

Minnesota Urological Society

Pyelogram Conference, Friday, March 18, 6:00 p.m. at the L'Hotel Sofitel. Contact: S. J. Antolak, Jr., M.D., 228 Lowry Medical Arts Building, St. Paul, 55102.

Bone Scanning

ROBERT R. McCLELLAND, M.D.*

Total body bone scans play an important role in the management of patients with known or suspected malignancy, but must be used properly. Abnormal bone scans are nonspecific and may be due to benign bone or soft-tissue disease, malignant bone or soft-tissue disease, or overlying normal soft-tissue structures which concentrate the bone scanning agents. A solitary bone scan focus correlated with normal roentgenograms of the same region does not necessarily indicate bone metastasis. Biopsy of the area in question must be performed to verify metastatic malignancy before a patient is deprived of primary curative surgery or curative radiation therapy. A system for bone scan utilization is presented and a review of the literature is made.

UNQUESTIONABLY BONE scanning has been revolutionized by the development of short half-life, single emission, metastable isotopes, such as ^{99m}technetium[1] complexed with phosphorus compounds such as polyphosphates, diphosphonates, and pyrophosphates.[2-6] Much scientific and clinical information has already been collected and published verifying the importance of these bone scanning agents in the management of patients with known or suspected neoplastic disease. It is futile to attempt a localized surgical or radiation cure of cancer when a patient has known bone metastases.

Mechanisms of Concentration

The exact mechanisms of concentration of current bone scanning agents in bones and soft tissues are not completely understood. Blood flow, osteoblastic activity, bone metabolism, and "chemisorption" involving active transport of calcium and phosphorus are apparently related to deposition in bone depending upon the phosphorus compound utilized.[2,4,7-16] These processes occur in benign as well as malignant bone disease. Deposition in soft tissue may in certain cases relate to calcium metabolism as substantiated by agent deposition in calcified soft tissues and vessels.[14,17-19] Calcium metabolism is also implicated in the uptake of current bone scanning agents in myocardial infarction.[20] Regardless of the mechanism, the uptake of bone scanning agents in bone and soft tissue is non-specific.

Soft-Tissue Uptake

Normal soft-tissue structures which take up the current bone scanning agents include thyroid gland, breast, gastrointestinal tract,[17] heart, liver, spleen, kidneys, bladder, and urethra.[21] Soft-tissue diseases, both benign and malignant, which concentrate bone scanning agents are numerous and have been discussed extensively in the current literature. These include soft-tissue malignancies;[12,17,19,22,23] soft-tissue inflammatory changes;[9-12] cerebral occlusive vascular disease with infarction;[13,24,25] myocardial infarction;[20,26] soft-tissue calcifications, such as myositis ossificans, vascular calcifications, and calcinosis;[14,17-19] soft-tissue trauma; irradiated tissue;[17] pleural effusion; muscle necrosis;[19] and others.

Bone Uptake

Any benign or malignant bone disease can cause increased activity on the bone scan. Causes of increased activity due to benign bone disease include degenerative changes;[17,27] osteomyelitis;[27,28] Paget's disease;[18,27] fibrous dysplasia; post-irradiation changes;[17,29] hypertrophic osteoarthropathy;[30,31] secondary hyperparathyroidism;[32] fracture;[2,27] osteoporosis, to include disuse osteoporosis, osteomalacia, and renal osteodystrophy; aseptic necrosis; myelofibrosis;[27] and others.

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See editorial, page 177.

Bone Scan Accuracy

Much has been written in the current literature about the early detection capabilities of the currently-used bone scanning agents, and much statistical data is available showing numbers of abnormal scans when roentgenograms of corresponding areas are normal.[33-36] Results correctly indicate that scans are 10% to 30%[36,37] better for detecting early metastases than roentgenograms. But one must not assume that a positive bone scan focus with negative roentgenograms of the same area necessarily indicates metastatic malignancy in a patient with known primary neoplasm.

Roentgenographic Correlation

Abnormal bone scans with normal correlative roentgenograms can be caused by any of the following:

1. Benign bone disease which is at a stage too early to be detected on roentgenograms.
2. Malignant bone disease which is at a stage too early to be detected on roentgenograms.
3. Overlying normal soft-tissue structures which concentrate bone scanning agents.
4. Overlying soft-tissue disease, either benign or malignant which concentrates bone scanning agents.
5. Unexplained concentration of bone scanning agents in bone or soft tissue.

Problem of Solitary Foci

The diagnostic problem of solitary foci of increased activity on bone scans in the presence of normal correlative roentgenograms is most difficult. In such cases the patient should not be deprived of a curative procedure on the primary malignancy without biopsy verification of the solitary bone scan abnormality.

Corcoran et al.[38] reported 142 of 2,000 bone scans (7%) having solitary abnormal foci. Only 41 of the 142 (29%) had radiographic or other data which confirmed the scan findings. Repeat bone scans were performed on 32 of Corcoran's patients with nonosseous primary malignancies and unconfirmed single bone scan foci. In five of these 32 patients the repeat bone scan did not reveal a lesion. In nine of the 32 patients the scan went from a solitary positive area to multiple areas of involvement. In the remaining 18 patients the single focus of increased activity persisted unchanged. In three cases of solitary rib scan lesions with normal roentgenograms excisional biopsies after tracer localization were also normal. We have encountered two cases with abnormal bone scan focus and normal roentgenogram in which biopsies revealed no abnormality and nonspecific inflammatory change respectively.

Recommended Interpretative Approach

In an effort to utilize the total body bone scan in the most effective manner the following general procedure is used at this institution:

1. In patients with known primary neoplasm with or without suspected metastases, the total body bone scan is performed utilizing ^{99m}Tc-pyrophosphate or diphosphonate.
2. If the total body bone scan is normal the patient is assumed free of metastases.
3. If there is one or more abnormal areas of increased activity on the bone scan, current roentgenograms of the appropriate areas are obtained and correlated utilizing the following scheme:
    a. *Abnormal bone scan with abnormal roentgenograms:* Nature of disease process is determined by roentgenographic findings.
    b. *Abnormal bone scan with normal roentgenograms:*
        1) Solitary bone scan focus with normal roentgenograms—biopsy recommended.
        2) Two or more bone scan foci with normal roentgenograms—assume metastasis. Followup scan recommended in three months.
    c. *Abnormal bone scan with several areas of increased activity which correlate with benign x-ray findings but with other scan defects which do not correlate:* Uncorrelated foci are handled as in subparagraph b above.

Sources of Error

The above scheme is not infallible. About one to four percent of bone scans are normal when patients do have metastases.[34,36,39,40] An alternative method is to perform total body scans as well as complete roentgenographic surveys on all patients.

It is also possible that several foci of increased activity on a bone scan will have normal bone roentgenograms and not be metastatic neoplasm. This could be seen in multiple early nonmalignant processes such as septic emboli (multifocal osteomyelitis) or arthritic conditions.

It is possible that an abnormal scan will, for example, correlate with a fracture which on roentgenograms has the appearance of a pathological fracture. In such a case a biopsy of the area of the fracture may be indicated.

Biopsy of an area can be inaccurate giving a false negative result. These errors can be minimized by accurately localizing for the surgeon the area of interest utilizing skin markers, followup bone scans, scans after biopsies, and other correlative methods.

Another source of error involves overlying soft-tissue activity causing an apparently abnormal bone scan when bone roentgenograms are normal. Clinically, soft tissues in the region of an abnormal bone scan must be carefully evaluated. Occasionally oblique or lateral scintiphotos will separate the soft-tissue activity from the normal bone activity.

References

1. Harper PV, Lathrop KA, Jiminez F, et al.: Technetium 99m as a scanning agent. Radiology 85:101, 1965.
2. Subramanian G, McAfee JG: A new complex of ^{99m}Tc for skeletal imaging. Radiology 99:192, 1971.
3. Subramanian G, McAfee JG, Bell EG, et al.: ^{99m}Tc-labeled polyphosphate as a skeletal imaging agent. Radiology 102:701, 1972.
4. Castronovo FP Jr, Callahan RJ: New bone scanning agent: ^{99m}Tc-labeled-1-hydroxy-ethylidene-1, 1-disodium phosphate. J Nucl Med 13:823, 1972.
5. Cohen Y, Perez R, Henry R, et al.: Utilization du pyrophosphate de sodium marque par le technetium 99m dans la scintigraphie du sequelette. CR Acad Sci (D) (Paris) 275:1719, 1972.
6. Eckelman WC, Reba RC, Kubota H, et al.: ^{99m}Tc-pyrophosphate for bone imaging. J Nucl Med 15:279, 1974.
7. Genant HK, Bautovich GJ, Singh M, et al.: Bone seeking radionuclides: an in vivo study of factors affecting skeletal uptake. Radiology 113:373, 1974.
8. Jung A, Bisaz S, Fleisch H: The binding of pyrophosphate and two diphosphonates by hydroxyapatite crystals. Calcif Tissue Res 11:269, 1973.
9. Bautovich G, Genant HK, Hoffer PB, et al.: In vivo study of the effects of tissue inflammation on the uptake of bone-seeking radionuclides—abstract. J Nucl Med 15:476, 1974.
10. Tilden RL, Jackson J Jr, Enneking WF, et al.: ^{99m}Tc-polyphosphate: Histological localization in human femurs by autoradiography. J Nucl Med 14:576, 1973.
11. Chaudhuri TK, Chaudhuri TK, Christie JH: Tumor uptake of ^{99m}Tc-polyphosphate: its similarity with ^{87m}Sr-citrate and dissimilarity with ^{67}Ga-citrate. J Nucl Med 15:458, 1974.
12. Chaudhuri TK, Chaudhuri TK, Gulesserian HP, et al.: Extraossesous noncalcified soft-tissue uptake of ^{99m}Tc-Polyphosphate. J Nucl Med 15:1054, 1974.
13. Grames GM, Jansen C. The abnormal bone scan in cerebral infarction. J Nucl Med 14:941, 1973.
14. Richards AG: Metastatic calcification detected through scanning with ^{99m}Tc-polyphosphate. J Nucl Med 15:1057, 1974.
15. Hamamoto K, Yamamoto I, Morita R, et al.: Bone scintigraphy with ^{99m}Tc-pyrophosphate—its relationship to bone matabolism—abstract. J Nucl Med 15:498, 1974.
16. Krishnamurthy GT, Tubis M, Endow JS, et al.: Clinical comparison of the kinetics of ^{99m}Tc-labeled polyphosphate and diphosphonate. J Nucl Med 15:848, 1974.
17. Thrall JH, Ghaed N, Pinsky SM, et al.: Pitfalls in the use of ^{99m}Tc-polyphosphate for bone scanning—abstract. J Nucl Med 14:460, 1973.
18. Pendergrass HP, Potsaid MS, Castronovo FP Jr: The clinical use of ^{99m}Tc-diphosphonate (HEDSPA). A new agent for skeletal imaging. Radiology 107:557, 1973.
19. Fitzer PM: ^{99m}Tc-polyphosphate concentration in a neuroblastoma. J Nucl Med 15:904, 1974.
20. Bonte FJ, Parkey RW, Graham KD, et al.: A new method for radionuclide imaging of myocardial infarcts. Radiology 110:473, 1974.
21. Charkes ND, Valentine G, Gravitz B: Interpretation of the normal ^{99m}Tc polyphosphate rectilinear bone scan. Radiology 107:563, 1973.
22. Matsui K, Yamada H, Chib AK, et al.: Visualization of soft tissue malignancies by using ^{99m}Tc-polyphosphate, pyrophosphate and diphosphonate—abstract. J Nucl Med 14:632, 1973.
23. Berg GR, Kalisher L, Osmond JD, et al.: ^{99m}Tc-diphosphonate concentration in primary breast carcinoma. Radiology 109: 393, 1973.
24. Wenzel WW, Heasty RG: Uptake of ^{99m}Tc stannous polyphosphate in an area of cerebral infarction. J Nucl Med 15:207, 1974.
25. Fischer KG, Pendergrass HP, McKusick KA, et al.: Increased brain scan specificity by the use of ^{99m}Tc-diphosphonate—abstract. J Nucl Med 15:490, 1974.
26. Parkey RW, Bonte FJ, Meyer SL, et al.: Detection of acute myocardiol infarction in humans using ^{99m}Tc stannous pyrophosphate (PY)—abstract. J Nucl Med 15:521, 1974.
27. Blair RJ, Bell EG, Subramanian G, et al.: Evaluation of ^{99m}Tc-polyphosphate imaging for non-neoplastic skeletal disease—abstract. J Nucl Med 13:414, 1972.
28. Waxman AD, Bryan D, Siemsen JK: Bone scanning in the drug abuse patient: early detection of hematogenous osteomyelitis. J Nucl Med 14:647, 1973.
29. Castronovo FP Jr, Potsaid MS, Pendergrass HP: Effects of radiation therapy on bone lesions as measured by ^{99m}Tc-diphosphonate. J Nucl Med 14:604, 1973.
30. Brower AC, Teates CD: Positive ^{99m}Tc-polyphosphate scan in case of metastatic osteogenic sarcoma and hypertrophic pulmonary osteoarthropathy. J Nucl Med 15:53, 1974.
31. Kay CJ, Rosenberg MA: Positive ^{99m}Tc-polyphosphate bone scan in a case of secondary hypertrophic osteoarthropathy. J Nucl Med 15:312, 1974.
32. Sy WM, Mittal AK: Bone scan on anephrics with evidence of secondary hyperparathyroidism—abstract. J Nucl Med 15: 536, 1974.
33. Silberstein EB, Saenger EL, Tofe AJ, et al.: Imaging of bone metastases with ^{99m}Tc-Sn-EHDP (diphosphonate), ^{18}F and skeletal radiography. Radiology 107:551, 1973.
34. Fletcher JW, Solaric-George E, Henry RE, et al.: Evaluation of ^{99m}Tc-pyrophosphate as a bone imaging agent. Radiology 109: 467, 1973.
35. Weber DA, Keyes JW, Benedetto WJ, et al.: ^{99m}Tc pyrophosphate for diagnostic bone imaging. Radiology 113:131, 1974.
36. Desaulniers M, Lacourciere Y, Lisbone R, et al.: A detailed comparison of bone scanning with ^{99m}Tc-polyphosphate and radiographic skeletal surveys for neoplasm. J Can Assoc Radiol 24:340, 1973.
37. O'mara RE: Bone scanning in osseous metastatic disease. JAMA 229:1915, Sept. 30, 1974.
38. Corcoran RC, Thrall J, Kyle R, et al.: The solitary bone lesion: a clinical dilemma—abstract. J Nucl Med 16:522, 1975.
39. Thrupkaew AK, Kenkin RE, Quinn JL: False negative bone scans in disseminated metastatic disease. Radiology 113:383, 1974.
40. Frankel RS, Johnson KW, Mabry JJ, et al.: "Normal" bone radionuclide image with diffuse skeletal lymphoma. Radiology 111:365, 1974.

Harold W. Brunn

Harold W. Brunn, Executive Vice President of the Minnesota State Medical Association, was elected to the board of directors of the Professional Convention Management Association in Atlanta, Georgia, January 7, 1977. Brunn is past president of the American Association of Medical Society Executives; director, State Medical Journal Advertising Bureau, Inc.; secretary-treasurer, Northlands Regional Medical Program; and secretary-treasurer, North Central Medical Conference. He is also a member of the American Alumni Council and Minnesota Law Alumni Association.

Editorials

Bone Scanning

The article on “Bone Scanning” appearing in this issue* provides a useful review of the assets and liabilities of bone scanning as related to actual clinical situations. The article does point out that “positive” bone scans in patients with presumed or known neoplastic disease does not necessarily mean the area in question is definitely metastasis. This often is a common assumption that can lead to serious errors in patient care. It also should be pointed out that there are times when one may have a positive roentgenogram but a negative bone scan, so the methods should be used to complement one another. It must be recognized that a bone scan is only a single tool in the vast laboratory armamentarium available to aid the physician and must be correlated with other clinical and laboratory data for best results.

Stephen Frytak, M.D.
Rochester, Minnesota

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*See page 174.

Placebo Effect on Exercise Response and Nitroglycerin Consumption

Hartman et al.* describe a small number of patients, and on first review presents an interesting and what would appear to be, a clinically significant contribution to the exercise literature. On further examination of the data, however, serious questions are raised. The enclosed Table of patient information is not well explained and has many questions that could be raised concerning it. If the data in the Table is in fact correct, it certainly needs greater amplification within the contents of the paper to clarify several questions. As the Table presents, each of the columns represent the mean for 20 patients. The group had a heart rate of 132 with a standard deviation of 17 implying that this group represents a very narrow selection and that the authors have, in fact, selected a group of patients with similar disease and exercise performance. This immediately skews the entire study, and if, as the Table presents, they were selected in this manner, makes invalid the conclusions derived in most part from this paper.

Furthermore, the coefficient of variation of 6% represented in the Graph does not appear to be correct. How this Figure is arrived at is not clearly stated in the context of the paper and needs to be explained. A review of the statistics in general, as presented, needs considerable amplification. Group selection and subjective end point determination of exercise as described by the paper, in a small group of patients, leaves doubt as to the reliability of the figures as presented.

G. T. Gau, M.D.
Rochester, Minnesota

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*Hartman, Keith E. et al.: Minnesota Med. 59:839, 1976.

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Letters to the Editor

Mobile Coronary Care

Dear Editor:

Suppose that a community fire department received 10,000 emergency calls in a year. Of these calls, only 199 proved to be fires at all. Ninety-eight percent were either false alarms or some other sort of tasks. Of the 199 fires, the structure burned to the ground before the fire department was able to do anything effective in all but 64 cases. In the 64 cases in which the fire fighting was given some chance, only 23 structures were salvaged.

We must further assume that an occasional fire might have subsided without complete destruction of the property. The 23 successes did not leave structures which had a very favorable prognosis for recurrent difficulties. In other words, in a high proportion of cases fires recurred which destroyed the structure within the ensuing months or few years.

If a fire department presented this data to indicate its effectiveness, the community would certainly wonder about the way it was spending its money. The article on "Mobile Coronary Care and the Management of Pre-Hospital Cardiac Arrest" by Drs. Engman, Campion, et al., in the December, 1976,* Minnesota Medicine presents this success rate for the 1974 operation of the paramedic system.

In addition to the direct cost of the system, costs involved in diversion of personnel from other duties must be considered. If the same degree of dedicated effort were devoted in other channels at possibly less cost, would we have a higher salvage rate than this popular and oftentimes dramatic program provides?

Paul D. Redleaf, M.D.
St. Paul, Minnesota

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*See page 833.

Paramedic Units

Dear Editor:

We read with interest Doctor Redleaf's letter commenting on our article, "Mobile Coronary Care in the Management of Pre-Hospital Cardiac Arrest." Unfortunately his analogy of the fire department receiving 10,000 emergency calls of which only 199 proved to be fires, misses the point of why mobile life support units have been established. The treatment of cardiac arrest is one small but important facet of the overall activities of the mobile life support unit. Approximately 50% of the calls to the St. Paul Fire Department Paramedic units are trauma related. Approximately 30% are related to the cardiopulmonary system. In cardiology we believe that the true value of the paramedics may be treating patients for premature ventricular contractions early, during stabilization, thereby possibly preventing ventricular fibrillation. Further, it would seem that many of the patients with non-cardiac disease but other emergencies would resent being categorized in Doctor Redleaf's category of "some other task." In regard to Doctor Redleaf's comment on the diversion of personnel from other duties, no additional fire fighters have been hired to perform the duties of paramedical personnel since the program's inception. One of its major advantages is that it more totally utilizes individual personnel who must be available to fight fires.

We would agree that diversion of money to prevent atherosclerotic disease may be more beneficial in the longrun, however, there are a number of people 40 years of age and over who might resent such a strategy.

We are grateful to Doctor Redleaf for allowing us to point out again that the treatment of cardiac arrest, while dramatic and much heralded is only one facet of the duties of the paramedics of the mobile life support units.

Brian C. Campion, M.D.*
John W. McBride, M.D.†
Linda A. Long, M.D.†
Pradub Sukhum, M.D.‡
St. Paul, Minnesota

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*Chief, Section of Cardiology, Co-Medical Director, St. Paul Fire Department Paramedic Program.
†Section of Cardiology, Co-Medical Director, St. Paul Fire Department Paramedic Program.
‡Section of Cardiology, St. Paul Ramsey Hospital, St. Paul, Minnesota.

Cancer of Breast

Dear Editor:

"Let the blind find a lump . . ."

In spite of many improvements in the treatment of cancer of the breast in women, the best chance to lower the mortality lies in early recognition. Regular self examination probably yields more suspicious lumps in the female breast than other modalities, as mass screening with thermography, mammography, or physical examinations.

I wonder if we have not overlooked one segment of population who, with proper training, could be of great value in the early detection of suspicious breast lesions; the blind. Early breast cancer lends itself very well to tactile detection. Thermal differences, nipple retraction, asymmetry and even orange peel skin can be felt. I have no doubt that blind persons, with proper training, could palpate early breast cancers with greater accuracy than most other people. If screening centers for breast cancer are envisioned, qualified, trained blind people should man them.

There may be other advantages. Women are probably less reluctant to present their breasts to somebody who can not see, and it would be a fine professional opportunity to this group of handicapped people.

H. W. Heupel, M.D.
Minneapolis, Minnesota

Microvascular Surgery

Dear Editor:

*Microvascular Surgery** was the title of an article written by Drs. George Irons and John E. Woods of the Mayo Clinic.*

Perhaps a sub-title should be added, A Review of English Literature.

Some of the pioneer work has been done in Japan and China. Having seen the results of one stage transfers of these inguinal flaps to forearms in Japan, I must say, this is a great savings in morbidity compared to delayed flap transfers.

In every paragraph of the article I searched for personal experience of Drs. Irons and Woods. Even the article with five illustrations showed only a laboratory setting and no clinical material. Perhaps, Drs. Irons and Woods would favor us with an early report of the stage of the art in Minnesota.

Kenath H. Sponsel, M.D.†
Minneapolis, Minnesota

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*Minnesota Med 60:27, 1977.

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Contraindications: Further use in progressive renal or hepatic dysfunction; hyperkalemia. Preexisting elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs. Routine use of diuretics in otherwise healthy pregnancy.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in severely ill patients with urine volume less than one liter/day, the elderly or diabetics, with suspected or confirmed renal insufficiency. Periodic determinations of serum K^+ should be made. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **The presence of a widened QRS complex or arrhythmia in association with hyperkalemia requires prompt additional therapy.** Thiazides are reported to cross the placental barrier and appear in breast milk; fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and other adverse reactions that have occurred in the adult may result. When used in pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics, or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium® (triamterene, SK&F Co.), and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Do periodic blood studies in cirrhotics to check for nondrug-related variations in blood pictures, and in patients with folic acid depletion, since 'Dyrenium' may contribute to appearance of megaloblastosis. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

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Minnesota State Medical Association Nominees For State Offices

In cooperation with the House of Delegates, we are publishing short biographies of the nominees for Minnesota State Medical Association offices. In addition, any delegate may make nominations from the House of Delegates floor after the report of the Nominating Committee.

Each elected official will assume his position at the conclusion of the 1977 Annual Meeting. The current president-elect, Chester A. Anderson, M.D., was elected in 1976 and will become president after the 1977 Annual Meeting concludes.

President

Malcolm M. Fifield, M.D.

Dr. Malcolm M. Fifield is board certified in urology and practices in Duluth in a four man urology group. He is on the staff of St. Luke's Hospital, where he was chief of staff in 1973, St. Mary's Hospital, and Miller-Dwan Hospital. With the opening of the medical school in Duluth, Dr. Fifield became clinical associate professor of urology.

He was president of the St. Louis County Medical Society in 1970 and has been a delegate to the Minnesota State Medical Association for the past seven years. Currently, he is chairman of the Judicial Committee and is first vice president of the MSMA.

Dr. Fifield lists membership in the Minnesota Surgical Society, and the American Urological Association. He is also a member of the Duluth Surgical Society which he served as president in 1968. He served on the executive council of the Minnesota Chapter, American College of Surgeons, and for three years was a member of the executive committee of the North Central Section of the American Urological Association.

Robert S. Flom, M.D.

Dr. Robert S. Flom is boarded by the American Board of Surgery, practicing in private practice with four other surgeons in St. Paul. He is a member of the American College of Surgeons; Minnesota Surgical Society; Minnesota Chapter of American College of Surgeons; and St. Paul Surgical Society.

Dr. Flom is a clinical assistant professor of surgery at the University of Minnesota. His past medical society offices include president of Ramsey County Medical Society, 1974; past secretary of the Minnesota State Medical Association; delegate to the Minnesota State Medical Association from Ramsey County, ten years; alternate delegate to the American Medical Association, four years; delegate to the American Medical Association, one year. He also served on the Ad Hoc Committee to the Council for Re-Organization of the State Medical Association.

First Vice-President

James B. Flinn, M.D.

Dr. James B. Flinn has been a Family Physician in Redwood Falls for 26 years. He served as a delegate to the House of Delegates from the Mid-Minnesota Medical Society.

He has been president of the Mid-Minnesota Medical Society, and serves on the board of directors of PSRO Area III at the present time.

William E. Wellman, M.D.

Dr. William E. Wellman is a consultant in the Department of Medicine (Infectious Diseases); Mayo Clinic; Rochester, MN, and associate professor of medicine Mayo Medical School. He has had an interest in organized medicine for many years and has served in all of the offices of the Zumbro Valley Medical Society. He has also served the Minnesota State Medical

Association in the House of Delegates, on the council, and on numerous committees. He was the first chairman of the Committee on Residents, Interns, and Medical School Students and continued as chairman until the past year. Several years ago he served as chairman of the Minnesota State Medical Association Committee on Aging and this created an interest in that field which has continued through many state and national organizations. He is at present President of the American Geriatrics Society.

Second Vice-President

Glen D. Nelson, M.D.

Dr. Glen D. Nelson is president and chairman of the Board of Trustees of the St. Louis Park Medical Center. Board certified by the American Board of Surgery, he is a fellow in the American College of Surgeons and a clinical associate professor, Department of Surgery, University of Minnesota.

Dr. Nelson is president-elect of the Western Trauma Association and a member of the Executive Committee of Inter Study, Inc. His other memberships include Minnesota Surgical Society, Minneapolis Surgical Society, American Medical Association, Hennepin County Medical Society, University Emergency Services Association, Minneapolis Academy of Medicine, American Academy of Medical Directors and the Western Surgical Association. He is a delegate to the American Group Practice Association.

Dr. Nelson also serves on the Boards of Methodist Hospital Foundation, Med Center Health Plan, St. Louis Park Medical Center Research Foundation .and Walker Art Center. He is a member of the Board of Regents of St. John's University.

Secretary

John M. Burns, M.D.

Dr. John M. Burns is board certified in Internal Medicine and Nephrology and practices in St. Paul with three associates. He is on the staff of all St. Paul hospitals and was chief of staff at Samaritan Hospital in 1973.

He has been an MSMA delegate for the past two years. Currently, he is chairman of the Hemodialysis Transplant Committee and also serves on the Committee on Aging.

Dr. Burns is a member of the St. Paul Society of Internal Medicine. He is a clinical assistant professor of Internal Medicine at the University of Minnesota Medical School. He is president of the Kidney Foundation of the Upper Midwest and president of the Minnesota Physicians United for Human Life.

Vincent E. Eilers, M.D.

For the past four years, Dr. Vincent E. Eilers has been a Ramsey County Medical Society delegate to the Association House.

An orthopaedic surgeon, Dr. Eilers was board certified in 1968. He is a member of the American Academy of Orthopaedic Surgeons, American College of Surgeons, St. Paul Surgical Society, Pan American Medical Association, and the Twin City Orthopaedic Society which he served as secretary for a year. He is an assistant clinical professor in orthopaedic surgery at the University of Minnesota Medical School and in 1975 served as chief of staff at Samaritan Hospital, St. Paul.

Treasurer

Paul S. Blake, M.D.

Dr. Paul S. Blake, Minneapolis neurological surgeon, is a member of eight hospital staffs in the Twin Cities metropolitan area and is on the Board of Trustees at St. Mary's Hospital.

He is a clinical assistant professor of neurological surgery at the University of Minnesota. Presently he is on the Board of the Hennepin County Medical Foundation. He was on the Board of Directors of the Hennepin County Medical Society for 12 years and served as its president in 1971.

Dr. Blake has served as a delegate to the MSMA for six years and is a member of the Committee on Permanent Evaluation and the Committee on Scholarships and Loans. He served on the Nominating Committee for three years and was a member of the Ad Hoc Committee of the council for the organization of the socio-economic division.

Joseph A. Cella, M.D.

Dr. Joseph A. Cella, Minneapolis, has combined a special interest in cancer and breast cancer screening with his specialty, obstetrics and gynecology.

In 1956-57, he served a year's clinical fellowship with the American Cancer Society at Mercy Hospital, Minneapolis. Since that time, he has been active in the work of the Society, currently serving as president of the Hennepin County Unit. As part of his society activities, he lectures under its public health program.

Dr. Cella is board certified by the American Board of Obstetrics and Gynecology and is a member of the American College of Obstetricians and Gynecologists. He is also associate clinical instructor of obstetrics and gynecology at the University of Minnesota.

Speaker of the House

Frederick E. Drill, M.D.

Dr. Frederick E. Drill is an orthopedic surgeon practicing in Minneapolis with two partners.

Dr. Drill, a University of Minnesota graduate, is a clinical associate professor of orthopedic surgery at the University, appointed to the Veteran's Administration Hospital in Minneapolis. He is certified by the American Board of Orthopedic Surgery and is a member of the American Academy of Orthopedic Surgery.

He serves on the hospital staffs of Fairview Southdale, Abbott Northwestern, Veterans and Methodist for which he was chief of staff in 1970.

He has served on numerous committees in both the Hennepin County Medical Society and Minnesota State Medical Association and is a member of the American Medical Association's Ad Hoc Committee on Professional Standard Review Organizations. He also served as president of the Foundation for Health Care Evaluation (Area II PSRO) in 1974 and became the Foundation's chairman in 1975.

James W. Halvorson, M.D.

Current Speaker of the House of Delegates, Dr. James W. Halvorson, Zumbrota, was Association vice president, 1971-72, and vice speaker, 1974-75.

He is a member of the Committees on Automotive Injuries; Residents and Medical Students and Mental Health and its Subcommittee on Alcoholism and other Chemical Dependencies. He is chairman of the Association-sponsored Discussion Group Concerned with the Alcohol-Impaired Driver and Highway Safety and on the Board of Editors of MINNESOTA MEDICINE.

In recognition of his work to combat alcoholism and for programs relating to the drinking driver, Dr. Halvorson was given the AAA Service to Motoring Award in 1972. He is on the Board of the Minnesota Council on Alcohol Problems and serves on the Advisory Committee to the Hennepin County Alcohol Safety Action Project.

Preceptor in family practice for Mayo Medical School, Dr. Halvorson has been in family practice in Zumbrota for nearly 20 years and is a Diplomat, American Board of Family Practice, and a Charter Fellow, American Academy of Family Physicians. He is a member and past president of the Goodhue County Medical Society which he long has served as delegate to the House of Delegates.

Vice-Speaker of the House

Severin H. Koop, Jr., M.D.

Dr. Severin H. Koop, Jr., St. Cloud, is past vice-speaker of the House of Delegates. A board certified otolaryngologist, Dr. Koop is past president of the Minnesota Academy of Ophthalmology and Otolaryngology. He is also clinical assistant professor at the University of Minnesota Department of Otolaryngology.

With the Association, Dr. Koop has been a member of the Committees on Conservation of Hearing and Medical School Relations and was first vice-president in 1973.

He lists membership in the Stearns-Benton County Medical Society, American Medical Association, and American Academy of Ophthalmology and Otolaryngology. In addition, he is presently chief of staff, St. Cloud Hospital.

Robert L. Sauer, M.D.

Dr. Robert L. Sauer has been in general practice in Preston for nine years.

He was a delegate to the Minnesota State Medical Association for eight years and a president of the Zumbro Valley Medical Society in 1976. Dr. Sauer is a member of the Association's Committee on Medical Aspects of Sports. In addition to the Association, Dr. Sauer is active in the American Academy of Family Practice and the Minnesota Academy of Family Practice.

Minnesota State Medical Association

'77 Meeting Offers

Technical, Practical Methods
For Improved Office Practice

Office practice and some techniques to improve it draw the spotlight at the 1977 Annual Meeting of the Minnesota State Medical Association—"Doctor's Office Call '77."

The meeting, scheduled May 19-20 at the Radisson South in Bloomington, will feature a full range of scientific assemblies and several programs in the non-technical areas of improving office PR, financial planning, professional liability, risk management, and others.

Arrangements are being completed to bring a noted national speaker to the meeting for the May 19 luncheon. Additional details will be reported in the April issue of MINNESOTA MEDICINE.

Activities actually kick off Wednesday, May 18, with golf and tennis tournaments. Members and their families are eligible to participate.

Also on Wednesday, the first session of the MSMA House of Delegates is convened. And, Reference Committees meet to review proposals submitted by component societies and other appropriate sources for consideration by the House of Delegates.

The scientific portion of the Annual Meeting is accredited by the American Medical Association. Full participation in the program will provide 12 credits in Category I of the Physician's Recognition Award. The program is acceptable for 12 prescribed hours by the American Academy of Family Physicians.

"Due to the CME accreditation requirements and out of courtesy to our speakers," notes Dr. Robert Semsch, chairman of the MSMA Scientific Assembly Subcommittee, "entry to program sessions will be closed 30 minutes after each program begins."

All participants in the meeting are encouraged by Dr. Semsch to return pre-registration information to MSMA early to avoid any potential for disappointment in scheduling, accommodations or meeting check-in. Anyone interested in attending a performance of the Metropolitan Opera Series should contact MSMA before March 14.

A highpoint of this year's meeting is the President's Reception and Annual Banquet, which will be held Thursday evening. During the banquet, eligible members will be inducted into the "Fifty Club," and winners of the Distinguished Service Award and President's Awards will be acknowledged.

In addition to the scientific sessions, the House of Delegates will hold its second session on Friday. Final event of the program will be a social activity, "Afternoon in Vienna," for all meeting participants.

Wives will be included in social and recreational programs in addition to a series of activities being planned by the MSMA Auxiliary. (Additional details next month.)

Special Address

Medical-Socio-Economic Emphasis—The Patient*

I ask you to review with me some recent statements on health care made by a responsible organization in Minnesota. Then I will identify that organization.

- The state should control the availability of professional liability insurance through a risk controlling mechanism or Joint Underwriting Association.
- Physicians should be reported to the State Board of Medical Examiners by their hospital when that hospital limits or suspends practice privileges.
- The State Board of Medical Examiners should require relicensure of all Minnesota physicians based on their completion of continuing medical education courses.
- Contraceptives should be made available to all persons regardless of marital status or age.
- Face masks.
- Contraceptives should be made more readily available by dispensing them in machines in public places such as rest rooms as well as pharmacies and health clinics.
- Multiple DEL mechanisms.
- The state should force Minnesotans to use automobile seat belts for their own safety.
- State laws designed to weed out the incompetent and/or sick physician should be strengthened.

Some pretty tough statements relating to our profession. Right? Who's responsible for them? Well, some of you may be surprised to know that all of these positions are supported by the Minnesota State Medical Association. And some of them have been enacted into law. Like, for example, the continuing medical education requirements for relicensure, hospital reporting of changes in a physician's privileges and the overall strengthening of the State Medical Examining Board's statutory authority to remove the sick and incompetent from the practice of medicine.

Tough statements that are representative of the kind of positions taken by organized medicine in Minnesota for the benefit of—not the profession—but the patients we serve. And as President of the Minnesota State Medical Association, I am pleased to be given this forum in which to enunciate our positions.

I have heard the charge that the Association's image in the Minnesota legislature isn't a very good one. Well, first that isn't true. And if it were the case, the public—our patients would be the loser—not the profession.

No, the Association isn't always successful in its support of a concept dealing with health care. But then with over 400 health related bills introduced in each session it would be totally unrealistic to win on every issue.

The important thing here is the degree of public consciousness exhibited by the Minnesota State Medical Association in its approach to positions taken on legislation. Here I believe we have an enviable record.

Recently, the Association's House of Delegates increased its dues to pay for a greatly expanded role in the medical socio-economic arena. As a result, we have restructured ourselves and enlarged the staff to give the Association more input into this vital arena.

Why do we want to be more involved in health legislation—health planning—and third party relationships? Is it only for the selfish interest of the medical profession? Of course not. If this were the only reason, the profession would have no standing whatsoever with the public. No, as a professional Association we must develop policies that are for the public good while protecting the legitimate interests of our member's right to practice good quality medicine, free as much as possible from outside interference that threatens that quality. Let me give you some examples.

The medical profession in Minnesota, as well as in the other 49 states, is facing a severe professional liability crisis. A crisis that threatens the ability of some of our colleagues to stay in practice.

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*Presented at the 1976 MSMA Socio Economic Conference, November 18, 1976.

Is it a selfish interest of the profession to want to propose legislative changes in the tort liability system when this system is costing the patient a national average of $1.24 for each visit to the doctor, $1.24 that goes to pay the physician's skyrocketing malpractice insurance premium. Consider also that as recent as 1973, the cost for each patient visit was only 30 cents.

Is it a selfish interest of the profession to have supported the Governor and Insurance Commissioner in this state, resulting in the successful enactment by the legislature this year of a risk pooling, joint underwriting association mechanism to insure a market of professional liability insurance should the private market dry up as it has in other states?

Is it self interest to demand tougher medical disciplinary authority for the State Medical Examining Board, along with mandatory continuing medical education requirements for relicensure? The Minnesota State Medical Association fought for that in the 1976 legislature and will continue to support measures to weed out the unfit from the practice of medicine.

While this will have some salutary effect on the professional liability crisis here in Minnesota, we still need changes in the tort liability system. We will, therefore, sponsor in the 1977 session, seven bills designed to reduce the cost of litigation and awards and reduce the frequency of suits.

Is it self interest of the profession to want some input into the health planning process—a process that is by federal decree—consumer dominated.

Look at the seriousness of this. With the passage of Public Law 93-641—the National Health Planning and Resource Development Act of 1974—health planning took a new turn—a turn away from medical professional involvement.

Minnesota now has seven regions—health service agencies—where in each case we find a board of some 30 or 60 individuals, the majority of which are consumers, and where at the most only five physicians are serving on a given board and usually less.

Now, I would be the last to discount the contribution consumers can make in health planning. We have had them from the very beginning on our Foundation Board in Hennepin County—now the PSRO for the Metropolitan area as well as the Northern part of Minnesota—and they have made an informed contribution. Our concern is the minority position the medical profession finds itself in respect to the decision making process in health planning.

Instead of walking away from the whole process as some state medical associations have done, we have developed a program of cooperation with the HSAs. The Minnesota State Medical Association has one staff person who does nothing but help physicians relate to each of the seven Minnesota HSAs. In each HSA region we are forming Advisory Committees of physicians to help the few physicians serving on these Boards along with the consumers. That help comes in the form of critiquing medical planning decisions made by the HSA Boards and offering constructive health planning proposals of our own.

Why are we doing this? I can assure you it is not because we want to attend more meetings. It is because poor health planning decisions will have a direct effect on the quality of medical care which will be received by the public—the consumers themselves—our patients.

Now let me ask you if it is in the self interest of the medical profession to have supported catastrophic health insurance which was passed by the legislature in 1976 with Association support as the *Comprehensive Health Care Act of 1976*. It is felt that this Act will have a direct impact on reducing costs of health insurance and providing better coverage in the catastrophic level.

Is it self interest to call upon the Minnesota Department of Public Welfare, as we have done, to join with the Minnesota State Medical Association in a joint effort to identify Medicare and Medicaid fraud if, indeed, it exists in this state and prosecute physicians and others involved to the fullest extent of the law?

I might say that while no such case has been identified to date in this state, we are working closely with DPW to monitor payments to insure that we will be the first to discover any irregularity or fradulent activity.

Is it, I ask you, in the self interest of this profession to support legislation which calls on programs for school health education in all grades, kindergarten through grade 12?

Was our support of prescription drug advertising legislation only in the self interest of the medical profession? This has been authorized now by the State Pharmacy Board without legislation and we expect this to reduce the cost of drugs.

Is it self interest to have supported the expansion of medical school enrollment at the University of Minnesota and new schools at the University of Minnesota-Duluth Branch and the Mayo Medical School? Such support by the Minnesota State Medical Association has had an indirect but real effect on the cost of medical care to the consumer by assisting and increasing available medical manpower in Minnesota.

Is it in the self interest of the profession for the Minnesota State Medical Association to demand free choice of medical provider for general relief recipients? In the 1976 session, the legislature enacted an Association sponsored bill guaranteeing free choice of provider to all county general welfare assistant patients. It was opposed by the Ramsey County Welfare Board which under the 1975 legislation had directed all county welfare patients to obtain their care at Ramsey County Hospital. We believe that welfare patients should have the same choice of physician and facility as others in the system. We fought for that right, and won. Is that in the self interest of the profession?

These, then are some of the examples of positions taken by the Minnesota State Medical Association to insure high quality medical care for consumers in this state—our patients.

Naturally, we cannot not always be supportive of an approach taken by members of the legislature, but when we oppose proposals of others it is on the basis of what we believe to be in the best interest of quality care. When you get right down to it, the Minnesota State Medical Association seldom differs on objectives—we all want the highest quality of care at the lowest price possible and care that is readily available to all. Differences, when they occur, relate to the best way of realizing those objectives.

I believe that the Minnesota State Medical Association has and will continue to be, a constructive force in the medical socio-economic arena. Our role is and should continue to be one of a vital partner in the entire health care process—a contributor to the resolving of key health care problems that develop in the system.

I hope that you will join with us as together we seek to maintain the highest quality of medicine at the lowest possible price and in making this available to the citizens—our patients—in the state of Minnesota.

Richard E. Anonsen, M.D.
President

MINNESOTA MEDICINE

The Board of Editors of Minnesota Medicine invites the members of the Minnesota State Medical Association to submit examples of their art work for publication on the cover of Minnesota Medicine. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of Minnesota Medicine, 101 East 5th St., Suite 900, St. Paul, Minnesota 55101.

Farrell Stiegler, M.D.
Cover Editor

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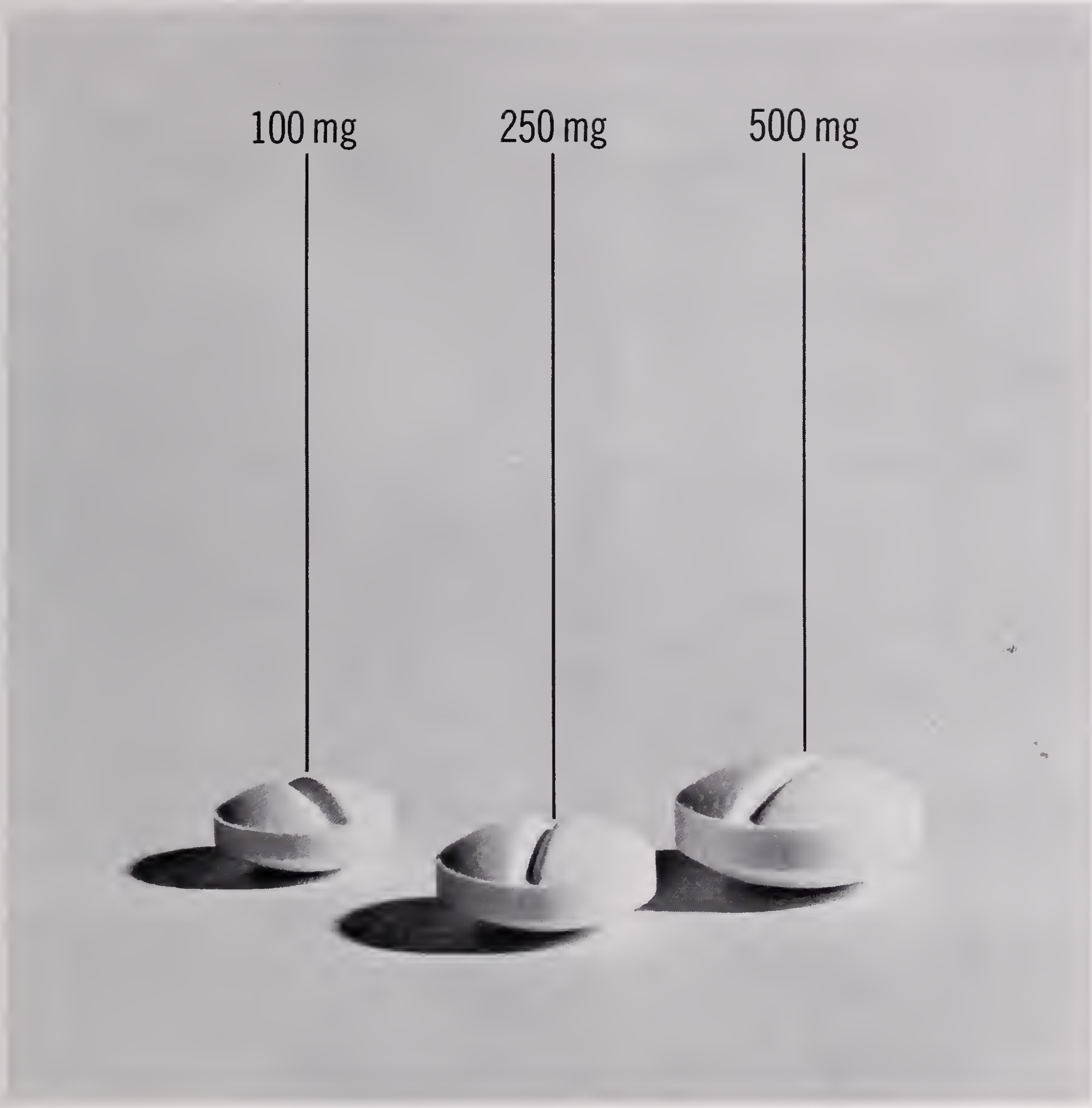
(Continued on page 207)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*INDICATIONS. Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

Effective: Management of nausea and vomiting and dizziness associated with motion sickness.

Possibly Effective: Management of vertigo associated with diseases affecting the vestibular system.

Final classification of the less than effective indications requires further investigation.

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Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

Usage in Children: Clinical studies establishing safety and effectiveness in children have not been done; therefore, usage is not recommended in the pediatric age group.

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Review

Induction of Ovulation with Clomiphene Citrate

LYNDON M. HILL, M.D.* and REGINALD A. SMITH, M.D.*

Clomiphene citrate has been commercially available since 1968. The limits of its efficacy have been ascertained through increased experience. Ovulation can be expected in 70% of patients, and pregnancy will occur in about 30%. Although the hyperstimulation syndrome is seen rarely, it can occur, and any evidence of ovarian enlargement dictates that clomiphene not be given for that month. The multiple gestation rate with clomiphene is 6 to 8%. Human chorionic gonadotropin may be given at midcycle for patients who have a short luteal phase.

THE REPORTED incidence of couples with at least a one-year history of infertility is between 10 and 20%. The married couple must be considered a sexual unit in order to determine the one factor or the several factors that may be the cause of their childless union.

The amount, morphology, motility, and cell count of the husband's sperm must be evaluated. Semen analysis is a rapid and simple test that in 40 to 50% of patients will indicate the cause of the infertility. Tubal disease, which includes the absence of patency, nonfunctioning fimbria, and a faulty tubal environment, is the basis for infertility in another 30% of couples. Uterine anomalies and uterine disease may cause primary infertility as well as habitual abortion. Abnormalities in cervical mucus, not only in amount, type, and consistency but also in its possible immunologic inhibition of sperm, are other causes for infertility. Certain ovarian abnormalities also must be considered. Within this group are various endocrinologic diseases that affect the patient's menstrual pattern, as well as disorders of the hypothalamic-pituitary-ovarian axis. This latter category is the basis for 10 to 20% of infertility.

Prior to the late 1950's, the management of oligo-ovulation and anovulation, although treated by many different modalities, seldom improved the spontaneous cure rate. The introduction of clomiphene citrate in 1968 and of gonadotropins in 1970 revolutionized the management of these fairly common causes of infertility.

Concomitant with the introduction of these new agents was the development of more sophisticated methods for studying the serum levels of various gonadotropins and hormones, thus allowing a better understanding of the normal menstrual cycle. A thorough familiarity of the gonadotropin and hormonal interrelationships involved in ovulation is the basis for the management of oligo-ovulation or anovulation.

As one cycle concludes with menstruation, the increasing level of follicle-stimulating hormone (FSH) stimulates an indeterminant number of follicles to develop. The mechanism for selecting which follicles within the ovary begin to develop and which follicle of the group becomes dominant and reaches full maturity has yet to be elucidated. As the follicles mature, estrogen production begins to increase, at first slowly and finally precipitously. FSH production declines by means of the negative feedback effect of estrogen. However, with development, the primary follicle becomes more sensitive to levels of FSH and hence maturation continues unabated.

The sudden increase in estrogen level near the middle of the cycle is believed to be the precipitating event for the sudden surge in the level of luteinizing hormone (LH) and the consequent ovulation. The maximal values of LH last for 16 to 20 hours.[1] After ovulation, the follicle undergoes luteinization, thereby causing a decrease in the estrogen levels. With maturation of the corpus luteum, the levels of both progesterone and estrogen increase. The maintenance of the corpus luteum is dependent on the level of LH. As endogenous levels of LH decrease, support of the corpus luteum is withdrawn. Only pregnancy with the production of human chorionic gonadotropin (HCG) will maintain corpus luteal function until placental development and maturation has occurred.

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If fertilization does not occur, the corpus luteum deteriorates and the levels of estrogen and progesterone dramatically decline, bringing on menstruation.[2-4]

Clomiphene citrate is used to reinstitute a normal ovulatory cycle in patients with various types of oligo-ovulation or anovulation.

Clomiphene Citrate

The chemical name for clomiphene (Figure 1) is 2-[p-(2-chloro-1,2-diphenylvinyl) phenoxy]-triethylamine dihydrogen citrate. It is an orally active, synthetic analogue of the nonsteroidal estrogen Tace. Investigation of this compound was initiated because original studies in rats indicated that the agent might be a contraceptive[5]. However, Greenblatt[6] found that clomiphene citrate could induce ovulation in some women with oligo-ovulation. It has been commercially available since 1968.

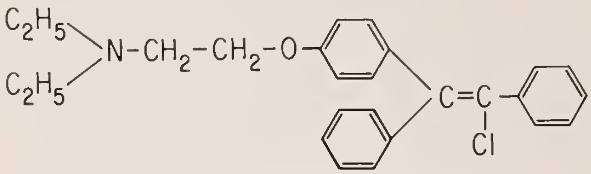

Fig. 1—Structural formula for clomiphene citrate.

Clomiphene is a mixture of two isomers—*cis*-clomiphene and *trans*-clomiphene—in a ratio of 1:1. *Cis*-clomiphene is about five times more potent than its co-isomer. Although some authors have found that *cis*-clomiphene has a higher pregnancy rate[7] than does the *trans* isomer, others have not.

Studies with tritiated estradiol have shown that clomiphene binds to the estradiol-binding receptors, both in the anterior hypophysis and in the anterior hypothalamus.[8] Thus, by excluding estradiol from receptor sites, clomiphene activates hypophyseal gonadotropin-releasing hormones into the portal system. This action is an attempt by the anterior hypothalamus to increase what it interprets as being a low level of serum estrogen. The releasing factors in turn increase the production and release of FSH and LH by the anterior pituitary.[9,10] Clomiphene is excreted primarily by the bowel—94% of a dose is eliminated within five days. Because the agent is excreted via the biliary pathway, patients with preexisting liver disease should not be given clomiphene.[11-13]

Patient Selection

Clomiphene is indicated for the induction of ovulation in a patient who has gonadotropin levels in the low-to-normal range and who has evidence of endogenous estrogen production (Table 1).

TABLE 1

Indications for Use of Clomiphene Citrate

Polycystic ovary syndrome
Oligo-ovulation or anovulation
Psychogenic amenorrhea
Post-pill amenorrhea
Secondary amenorrhea
Del Castillo syndrome
Chiari-Frommel syndrome

Spontaneous though irregular menses and menstrual bleeding after progesterone administration are indicators of adequate estrogen production. The polycystic ovary syndrome and oligo-ovulation tend to respond best to clomiphene therapy. In the early trials of clomiphene, patients with ovarian insufficiency and pituitary failure were included within the treatment group. However, such patients did not respond to clomiphene. For a response, the patient must have an intact hypothalamic-pituitary-ovarian axis on which clomiphene can act.

Evaluation before Clomiphene Therapy

Opinions differ as to the extent of the work-up before clomiphene can be used in the infertility patient who has a history of oligo-ovulation. The present policy at the Mayo Clinic is to individualize each family's work-up. Thus, for some patients, the history alone may indicate that oligo-ovulation is the cause of a couple's infertility. If the husband has a normal sperm count and the wife gives no history of pelvic inflammatory disease, a trial of clomiphene therapy may be undertaken. The method of treatment, likelihood of success, necessity of follow-up visits, and complications are discussed in detail with the couple before a six-month course of clomiphene is instituted. For other couples, when the diagnosis is not so clear-cut or when the couple has been referred for diagnosis and definitive treatment, we evaluate all of the factors that might cause infertility before we consider the use of clomiphene. In addition to routine laboratory data, we obtain a sperm count, endometrial biopsy, hysterosalpingogram, and measurements of T3 and T4. The sella turcica is evaluated roentgenographically, and serum gonadotropin and urinary estrogen levels are measured.

Treatment Schedule

Despite the recommendations of the manufacturer, the dosage regimen used varies markedly from institution to institution, and a number of different dosage schedules have been recommended (Table 2). Implied in most of these regimens is the necessity for individual variation based on the patient's response to the medication.

Most patients who respond will do so in the lower dose range and during the first few cycles.[14,15] As the dose of clomiphene is increased, a smaller and smaller percentage of the remaining oligo-anovulatory patients respond. In addition, as the total dose of clomiphene given per cycle increases, so does the percentage of patients affected by complications. Thus, we generally follow the No. 6 dosage schedule of treatment given in Table 2. With careful monitoring of the patient, both by physical examination and basal body temperature charts, one can increase the dose of clomiphene with safety. Usually, however, we tend to stop treatment at a maximal dose of 150 mg/day for five days. If this has not produced an ovulatory pattern on the basal body temperature chart, 10,000 IU of HCG are given on the 14th day of the patient's cycle, five days after the end of the five-day course of clomiphene. HCG is given in an attempt to mimic the midcycle surge of LH.

Once the ovulatory dose of clomiphene has been ascertained, the couple is encouraged to have intercourse every other night for one week, beginning five days after the last dose of clomiphene. The patient is most fertile at this time because ovulation occurs consistently seven to 14 days after the last tablet of clomiphene is taken.[16-18]

The shift in basal body temperatures of a patient who has ovulated but has not become pregnant is shown in Figure 2.

TABLE 2

Suggested Dosage Schedules for Clomiphene Use

Schedule	Comment
No. 1 Daily dose: 150 mg Duration: 3 days	Starting on day 10 of menstrual cycle
No. 2 Daily dose: 100 mg Duration: 4 days	Increase daily dose to 200 mg if response is inadequate
No. 3 Daily dose: 50 mg Duration: 5 days	Starting on day five of menstrual cycle; if no response in three cycles, increase daily dose to 100 mg
No. 4 Daily dose: 50 mg Duration: 5 days	Increase daily dose in 50-mg increments until evidence of ovulation; continue this dose until conception (maximal daily dose, 250 mg)
No. 5 Daily dose: 50 mg Duration: 5 days	Starting on day five of menstrual cycle; increase daily dose by 50-mg increments until evidence of ovulation or maximal daily dose of 200 mg; if no ovulation at maximal dose, repeat course and add 5,000 IU of HCG seven days after last pill
No. 6 Daily dose: 50 mg Duration: 5 days	Starting on day five of menstrual cycle; if no response in three cycles, increase daily dose by 50 mg every three cycles until response or maximal daily dose of 200 mg; if no ovulation at maximal dose, repeat course and add 10,000 IU of HCG on 5th to seventh day after clomiphene

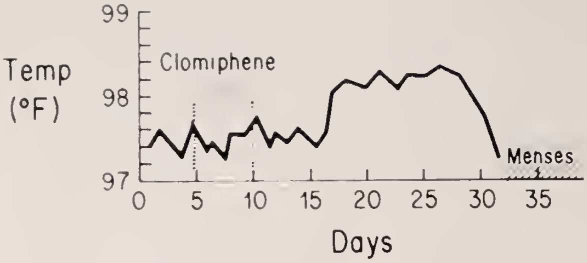

Fig. 2—Shifts in basal body temperature with ovulation.

This patient was a 27-year-old woman (gravida O, para O) who had her menarche at the age of 13 years. She had never had more than six menses in one year. The patient had been married for three years and had never used any means of contraception. She was referred primarily because of infertility. After a preliminary work-up, the patient received 50 mg of clomiphene per day for three months, from the 5th to the 10th day of the menstrual cycle. However, she did not ovulate. On the fourth cycle, ovulation occurred at the increased dosage level of 100 mg/day for five days. This regimen was continued, and the patient ovulated and became pregnant on her sixth treatment cycle.

The basal body temperature chart of a patient who required HCG during midcycle is illustrated in Figure 3.

This patient was a 35-year-old woman (gravida O, para O) who had her last menstrual period approximately 13 years before her visit to our clinic. She had her menarche at the age of 13 years, with regular cycles until the age of 24 years, at which time she became amenorrheic. On careful questioning, the patient admitted to occasional light vaginal spotting. She denied having any spotting, however, during the two years before our evaluation.

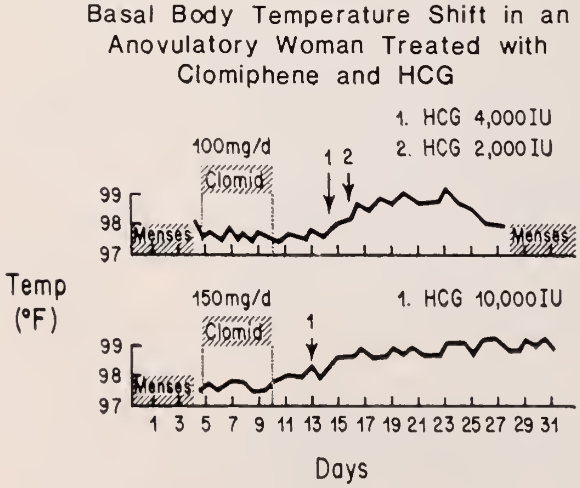

Fig. 3—Shifts in basal body temperature in an anovulatory woman treated with clomiphene and human chorionic gonadotropin.

The review of systems was noncontributory, and results of physical examination were normal. The husband's sperm was adequate. Hysterosalpingogram revealed that the uterus was normal in contour and that the tubes were patent. Because of the duration of suppression of menstrual function, endometrial biopsy revealed squamous epithelium. Levels of serum gonadotropin were normal.

The patient was given medroxyprogesterone (10 mg orally) every day for one week. However, withdrawal bleeding did not occur. In the following month, hydroxyprogesterone (250 mg intramuscularly) was given, and the patient had withdrawal bleeding. Clomiphene therapy (50 mg orally every day for five days) was started on the fifth day. At this dose, the basal body temperature curve remained flat during the next three cycles. Before the fourth cycle, an endometrial biopsy specimen was obtained which revealed secretory endometrium. The patient's dose of clomiphene was increased to 100 mg a day for five days.

On her second and third courses of clomiphene at this dose, the basal body temperature curve showed a short luteal phase. The treatment course, therefore, was supplemented on day 14 with 4,000 IU of HCG and on day 16 with 2,000 IU of HCG (Figure 3). The clomiphene dose was then increased to 150 mg/day. The luteal phase was again inadequate on clomiphene therapy alone. On the second, third, and fourth cycles at this dose level, the patient was given 10,000 IU of HCG on the 13th day. On each occasion, the basal body temperature curve showed apparent ovulation. The elevation of the basal body temperature was sustained on the fourth cycle, and results of a pregnancy test done several weeks later were positive.

Presumptive Indicators of Ovulation

The presumptive indicators of ovulation that may be utilized in following the patient given clomiphene citrate are listed in Table 3. The basal body temperature graph is the most commonly used method for monitoring a patient's response to clomiphene. It is simple, inexpensive, noninvasive, and reliable. Ideally, there should be an abrupt elevation in the basal body temperature curve near the time of ovulation because of the thermogenic effect of progesterone. Unfortunately, patient error in the timing and reading of the thermometer, as well as a failure in a fair proportion of cases for the abrupt easily identifiable shift in temperature to occur, makes this method of monitoring less than ideal. Furthermore, careful studies comparing basal body temperature curves on the day of the temperature increase with the actual microscopic examination of the patient's ovaries have shown that ovulation did not occur in approximately one-third of patients. In the remaining patients, ovulation occurred as long as 72 hours before the increase in the basal body temperature curve.[19] In a confirming study, Whitelaw[20] found that endometrial biopsies and basal body temperature graphs are not necessarily correlated. Some patients have evidence of secretory endometrium on biopsy specimens during the second half of the menstrual cycle while their basal body temperature curves remain flat.

TABLE 3

Presumptive Indicators of Ovulation

- **Basal body temperature curve**
- **Evaluation of cervical mucus**
  - **Spinnbarkeit**
  - **Arborization**
  - **Burning phenomenon**
- **Vaginal cytology**
- **Decreasing blood basophil count**
- **Decreasing ascorbic acid concentration in the urine**
- **Endometrial biopsy**
- **Increasing urinary estrogen**
- **Increasing urinary pregnanediol**
- **Increasing serum progesterone**

Evaluation of the cervical mucus involves microscopic examination during the early and late parts of the cycle to detect a change from the presence to the absence of arborization. In addition, cervical mucus at ovulation may be drawn into threads (Spinnbarkeit) longer than 6 cm. The "burning phenomenon"[21] involves the drying of endocervical mucus under a flame. The mucus will spontaneously change colors, depending on the day of the cycle on which the test is performed. At ovulation, the cervical mucus remains unchanged. However, it turns various shades of brown both before and after ovulation. These changes are believed to be secondary to the increase in water content and glucose present at ovulation, thereby preventing the discoloration seen at other times of the cycle.

Microscopic examination of exfoliated vaginal cells likewise reflects the changing hormonal milieu. The number of cornified cells per 100 cells counted (cornification index) increases with the effect of estrogen on the preovulatory phase of the menstrual cycle. After ovulation, the index decreases secondary to the changing hormonal milieu.

Brandl and Mettler (1974)[21] found that a decreasing blood basophil count and decreasing levels of urinary ascorbic acid are accurate indices of ovulation.

The other possible parameters are self-explanatory. Although more elaborate, they do not significantly increase the accuracy of diagnosis of ovulation over the use of the basal body temperature curve.

Follow-up Visits

After a patient has been given clomiphene, she should be seen before each treatment cycle or sooner if indicated. At that time, the patient is questioned whether or not she has had any side effects during the treatment regimen, and these are discussed with the patient in detail. The basal body temperature curve for the previous cycle is then reviewed. A pelvic examination is always performed to rule out the possibility of ovarian enlargement. If an ovarian cyst was present at examination, clomiphene use must be withheld for the next cycle because of the chance of ovarian hyperstimulation. Any increase in ovarian size usually resolves promptly, and succeeding treatment cycles rarely need to be postponed. A lower dose of clomiphene would be used in succeeding cycles if an ovarian cyst is palpated.

Results

The desired end result of clomiphene therapy is pregnancy. However, an apparent discrepancy exists between the ability of clomiphene to induce ovulation and the ultimate pregnancy rate. Most studies report an ovulation-to-pregnancy ratio of approximately 2:1. In 1974, Rust, Israel, and Mishell[14] reviewed six studies and found that the range for ovulation induction was 45.7 to 94% and that the pregnancy rate varied from 14 to 65.5%. The average for ovulation induction remains about 70%, and the pregnancy rate is near 30%.[16-18,22-26] One reason for the wide range in the reported statistics for both ovulation and pregnancy, particularly in a series with only 25 patients or less in a treatment group, is the incidence of spontaneous or placebo-induced ovulation and resulting pregnancy. In 1966, Cudmore and Tupper[27] found an ovulation rate of 25% with a placebo compared with a rate of 50% with clomiphene citrate. MacLeod et al.[28] found an ovulation rate of 20% with a placebo. These studies emphasize the importance of psychologic factors during the work-up and treatment of the infertile couple. Another factor influencing the variability in reported statistics is the marked difference in dosage regimens and duration of treatment.

About 25% of fertile couples will conceive after intercourse at the appropriate time of the ovulatory cycle.[29] Guttmacher,[30] after combining a number of series, calculated that the conception rate for the normally fertile couple was 57% after 3 months, 72% after six months, and 88% after one year.[31] Thus, the longer clomiphene therapy is continued after the ovulatory dose is determined, the better the chance for pregnancy. However, patients will not always respond to what has been determined as their ovulatory dose.[32] Hence, an adequate trial of clomiphene usually requires from 6 to 9 "ovulatory" cycles.[14]

The definition of an ovulatory cycle is based on events that occur secondary to ovulation. These events (basal body temperature elevation, cervical mucus changes, and so forth) can occur without ovulation. This is believed to be the primary reason for the discrepancy between the ovulation and pregnancy rates in patients receiving clomiphene.[17-26] However, there are other possible causes for the difference (Table 4).

Hostile cervical mucus has been mentioned by some authors.[19,33,34] Thick, tenacious mucus secondary to the antiestrogenic effect of clomiphene may inhibit the migration of sperm and thereby reduce the pregnancy rate. Insler et al.,[33] in 1973, suggested that ethinyl estradiol (75 to 150 μg/day) be used from the last two days of clomiphene ingestion until ovulation has occurred. While improving the cervical mucus, this treatment did not reduce the ovulation rate from clomiphene administration. In 1971, Graff,[35] in a careful study of 225 women receiving clomiphene, found that the incidence of hostile cervical mucus was only 16%. None of the patients had faulty cervical mucus before clomiphene therapy. Hancock and Oakey,[31] while agreeing that clomiphene has an anti-estrogenic effect on the cervical mucus, found that this effect disappeared within one week after the use of the drug was stopped (that is, before ovulation occurred).

The final theory worthy of mention is that of a possible luteal phase defect.[16,36] Such a defect may be diagnosed if the endometrial biopsy is dated two days or more behind the menstrual date. In 1970, Jones et al.[36] found that 32 of 70 women studied while on clomiphene therapy had evidence of luteal phase abnormalities. These defects recurred in succeeding cycles and were not correctable by increasing the dose of clomiphene. Kistner,[37] in 1966, was the first to suggest that HCG be used with clomiphene in order to enhance the surge of LH at midcycle.[20,24,38]

TABLE 4

Reasons for Difference Between Ovulation and Pregnancy Rates With Clomiphene

- **Luteinization of a developing follicle without ovulation (incorrect assumption of ovulation)**
- **Hostile cervical mucus**
- **Ovum entrapment**
- **Accelerated tubal transport**
- **Early unrecognized abortion**
- **Luteal phase defect**

A frequently mentioned but misunderstood aspect of clomiphene treatment is its long-term effect on the menstrual cycle. Several authors have reported that spontaneous ovulatory cycles occurred after clomiphene therapy.[18,39-41] Spontaneous pregnancy rates after induction of ovulation with either clomiphene or gonadotropins have been reported to be between 30 and 50%.[42,43] Whether this outcome reflects a real difference from the spontaneous cure rate from oligo-ovulation or anovulation is debatable.[44] It is postulated that the induced ovulation or pregnancy (or both) corrected the disturbed feedback mechanism of the hypothalamic-pituitary-ovarian axis.[42]

Once the patient treated with clomiphene becomes pregnant, the spontaneous abortion rate is between 20 and 25%.[14,19,24] This is approximately equivalent to the abortion rate in careful prospective studies of the general population.[45] Likewise, the incidence of congenital anomalies is no higher than that in the population at large.[22,39]

Complications

The frequency of complications seen with clomiphene use is dependent on the dose prescribed, duration of treatment, and individual patient sensitivity (Table 5).[22] Generally, the higher the dose, the greater the incidence of side effects.

The most commonly reported side effect is vasomotor instability, represented by "hot flushes." They are noted in 10 to 15% of patients,[16] and the effects are believed to be secondary to the anti-estrogenic influence of clomiphene. These "menopausal symptoms" quickly abate during the rest period between clomiphene

TABLE 5
Side Effects of Clomiphene Therapy*

Effect	%
Hot flushes	10-15
Ovarian enlargement	2.5-14
Multiple birth rate	6-8
Abdominal and pelvic discomfort	7.0
Nausea and vomiting	2.1
Breast tenderness	2.0
Visual symptoms	1.6
Increased nervous tension	1.0
Headaches	1.0
Insomnia	0.9
Increased urinary frequency	0.8
Dizziness	0.7
Depression	0.7
Urticaria	0.6
Heavier menses	0.5
Weight gain	0.4
Reversible hair loss	0.4
Rapid enlargement of fibroids	Rare

*Data modified from MacGregor et al.[22]

courses.[12]

Ovarian enlargement as a side effect of clomiphene ingestion is being reported less frequently in recent years. A review of the literature revealed that the incidence was between 2.7 and 14%[11] In doses less than 150 mg/day, ovarian enlargement is infrequent, although it can occur. Kempers et al.[23] found that four patients had ovarian cysts during a study of 155 treatment cycles (2.5%). If an enlarged ovary is discovered on examination before a cycle, the drug should not be prescribed. Massive ovarian hyperstimulation[46] has been described secondary to clomiphene ingestion, but this is a rare occurrence. Slight cystic enlargement of the ovaries is more common. However, it does not become evident until *after* ovulation, seven to 10 days from the last dose of clomiphene.

The increased evidence of multiple births is considered to be an undesired side effect. Although the incidence of identical twins remains the same, the frequency of fraternal twins is increased seven to eight times. The cause for this increase is the maturation and development of more than one follicle by clomiphene stimulation. Although births of triplets, quadruplets, and quintuplets have been reported, most multiple pregnancies are twin gestation.

Abdominal or pelvic discomfort is a vague and usually unimportant side effect. However, it may indicate ovarian hyperstimulation, and patients with this complaint should be evaluated.

Visual disturbances vary from scotoma to blurred vision. After clomiphene administration is stopped, these symptoms gradually disappear in days to weeks.[13,22] Although objective ophthalmologic damage has not been found,[13] some authors consider these symptoms to be a contraindication to further use of clomiphene.[47]

Rapid enlargement of leiomyomas can be a complication, but this is rare. Only two cases of this side effect could be found in the English literature.[48,49]

Conclusion

Clomiphene is a relatively safe and effective means for ovulation induction in properly selected patients. Each dose of clomiphene should be used for three cycles. If no response occurs, the daily dose may be increased by 50 mg every three cycles, until a response is obtained or a maximal dosage of 150 to 200 mg/day is reached. In appropriate patients, human chorionic gonadotropin may be administered at midcycle to simulate the luteinizing hormone surge.

Ovarian hyperstimulation does not become evident until after ovulation, seven to 10 days from the last clomiphene dose. The best treatment is, therefore, a careful evaluation of the patient before clomiphene is prescribed for the next cycle. The multiple gestation rate with clomiphene is six to eight percent. Most multiple pregnancies are twin gestation.

References

1. Johansson EDB, Wide L: Periovulatory levels of plasma progesterone and luteinizing hormone in women. Acta Endocrinol (Kbh) 62:82, 1969.
2. Speroff L, Glass RH, Kase NG: Clinical Gynecologic Endocrinology and Infertility. Baltimore, Williams & Wilkins Company, pp 31-37, 1973.
3. Green TH: Gynecology: Essentials of Clinical Practice. Second edition. Boston, Little, Brown & Company, pp 107-133, 1971.
4. Black WP, Martin BT, Whyte WG: Plasma progesterone concentrations as an index of ovulation and corpus luteum function in normal and gonadotrophin-stimulated menstrual cycles. J Obstet Gynaecol Br Commonw 79:363, 1972.
5. Holtkamp DF, Greslin JG, Root CA, et al.: Gonadotropin inhibiting and anti-fecundity effects of chloramiphene. Proc Soc Exp Biol Med 105:197, 1960.
6. Greenblatt RB: Chemical induction of ovulation. Fertil Steril 12:402, 1961.
7. Van Campenhout J, Borreman E, Wyman H, et al.: Induction of ovulation with cisclomiphene. Am J Obstet Gynecol 115:321, 1973.
8. Kato J, Kobayashi T, Villee CA: Effect of clomiphene on the uptake of estradiol by the anterior hypothalamus and hypophysis. Endocrinology 82:1049, 1968.
9. Paulson DF, Wacksman J, Hammond CB, et al.: Hypofertility and clomiphene citrate therapy. Fertil Steril 26:982, 1975.

10. Roy S, Mahesh VB, Greenblatt RB: Effects of clomiphene on the physiology of reproduction in the rat. Acta Endocrinol (Kbh) 47:669, 1964.
11. Kistner RW: Further observations on the effects of clomiphene citrate in anovulatory females. Am J Obstet Gynecol 92:380, 1965.
12. Kistner RW: Induction of ovulation with clomiphene citrate. **In** Progress in Infertility. First edition. Edited by SJ Behrman, RW Kistner. Boston, Little, Brown & Company, pp 407-453, 1968.
13. Bishop PMF: Clomiphene. Br Med Bull 26:22, 1970.
14. Rust LA, Israel R, Mishell DR Jr: An individualized graduated therapeutic regimen for clomiphene citrate. Am J. Obstet Gynecol 120:785, 1974.
15. Goldfarb AF, Morales A, Rakoff AE, et al.: Critical review of 160 clomiphene-related pregnancies. Obstet Gynecol 31:342, 1968.
16. Murray M, Osmond-Clarge F: Pregnancy results following treatment with clomiphene citrate. J Obstet Gynaecol Br Commonw 78:1108, 1971.
17. Kase N, Mroueh A, Olson LE: Clomid therapy for anovulatory infertility. Am J Obstet Gynecol 98:1037, 1967.
18. Osmond-Clarke F, Murray M, Bishop PMF: The induction of ovulation with clomiphene and its assessment by biological methods. J Obstet Gynaecol Br Commw 75:531, 1968.
19. Whitelaw MJ, Kalman CF, Grams LR: The significance of the high ovulation rate versus the low pregnancy rate with clomid: a review of 203 private anovulatory patients. Am J Obstet Gynecol 107:865, 1970.
20. Whitelaw MJ: The effect of female hormones on the basal body temperature (abstract). J Clin Endocrinal 10:842, 1950.
21. Brandl E, Mettler L: Timing of ovulation in a sterility clinic. Int J Fertil 19:13, 1974.
22. MacGregor AH, Johnson JE, Bunde CA: Further clinical experience with clomiphene citrate. Fertil Steril 19:616, 1968.
23. Kempers RD, Decker DG, Lee RA: Induction of ovulation with clomiphene citrate. Obstet Gynecol 30:699, 1967.
24. Rivo E, Rock J: The clinical use of clomiphene citrate Pacif Med Surg 73:413, 1965.
25. Kistner RW: Induction of ovulation with clomiphene citrate (clomid). S Afr J Obstet Gynaecol 5:25, 1967.
26. Rabau E, Serr DM, Mashiach S, et al.: Current concepts in the treatment of anovulation. Br Med J 4:446, 1967.
27. Cudmore DW, Tupper WRC: Induction of ovulation with clomiphene citrate: a double-blind study. Fertil Steril 17:363, 1966.
28. MacLeod SC, Mitton DM, Parker AS, et al.: Experience with induction of ovulation. Am J Obstet Gynecol 108:814. 1970.
29. Adams R, Mishell DR Jr, Israel R: Treatment of refractory anovulation with increased dosage and prolonged duration of cyclic clomiphene citrate. Obstet Gynecol 39:562, 1972.
30. Guttmacher A: Cited by Hancock KW, Oakey RE 31
31. Hancock KW, Oakey RE: The low incidence of pregnancy following clomiphene therapy. Int J Fertil 18:49, 1973.
32. Whitelaw MJ: Clomiphene citrate: experience with 217 patients; variation in response and unusual reactions. Fertil Steril 17:584, 1966.
33. Insler V, Zakut H, Serr DM: Cycle pattern and pregnancy rate following combined clomiphene-estrogen therapy. Obstet Gynecol 41:602, 1973.
34. Figueroa CPR, Arcangeli OA, Gowland CM, et al.: Effect of clomiphene citrate upon parameters of ovulation in patients selectively operated upon during drug administration. Am j Obstet Gynecol 106:828, 1970.
35. Graff G: Suppression of cervical mucus during clomiphene therapy. Fertil Steril 22:209, 1971.
36. Jones GS, Maffezzoli RD, Strott CA, et al.: Pathophysiology of reproductive failure after clomiphene-induced ovulation. Am J Obstet Gynecol 108:847, 1970.
37. Kistner RW: Use of clomiphene citrate, human chorionic gonadotropin, and human menopausal gonadotropin for induction of ovulation in the human female. Fertil Steril 17:569, 1966.
38. Radwanska E, Swyer GIM: Plasma progesterone estimation in infertile women and in women under treatment with clomiphene and chorionic gonadotrophin. J Obstet Gynaecol Br Commonw 81:107, 1974.
39. Hack M, Brish M, Serr DM, et al.: Outcome of pregnancy after induced ovulation: follow-up of pregnancies and children born after clomiphene therapy. JAMA 220: 1329, 1972.
40. Roland M: Problems of ovulation induction with clomiphene citrate with report of a case of ovarian hyperstimulation. Obstet Gynecol 35:55, 1970.
41. Matthews CD, Cox LW: The effect of treatment for non-ovulation, or an induced-ovulation pregnancy, upon subsequent menstrual patterns and further spontaneous pregnancy. Fertil Steril 24:758, 1973.
42. Canales ES, Zarate A, Gonzales A, et al.: Occurrence of spontoneous second pregnancy after delivery of conceptions resulting from ovulation induced by various therapeutic modalities. Int J Fertil 18:182, 1973.
43. Pennington GW, Atlay RD: Some surprising results in the investigation and treatment of the infertile woman. J Obstet Gynaecol Br Commonw 79:651, 1972.
44. Cox LW: Infertility: a comprehensive programme. Br J Obstet Gynaecol 82:2, 1975.
45. Hellman LM, Pritchard JA: Williams Obstetrics. 14th edition. New York, Appleton-Century-Crofts, p 496, 1971.
46. Southam AL, Janovski NA: Massive ovarian hyperstimulation with clomiphene citrate. JAMA 181:443, 1962.
47. Kase N: Induction of ovulation with clompiphene citrate. Clin Obstet Gynecol 16:192, 1973.
48. Frankel T, Benjamin F: Rapid enlargement of a uterine fibroid after clomiphene therapy. J Obstet Gynaecol Br Commonw 80:764, 1973.
49. Felmingham JE, Corcoran R: Letter to the editor. Br J Obstet Gynaecol 82:431, 1975.

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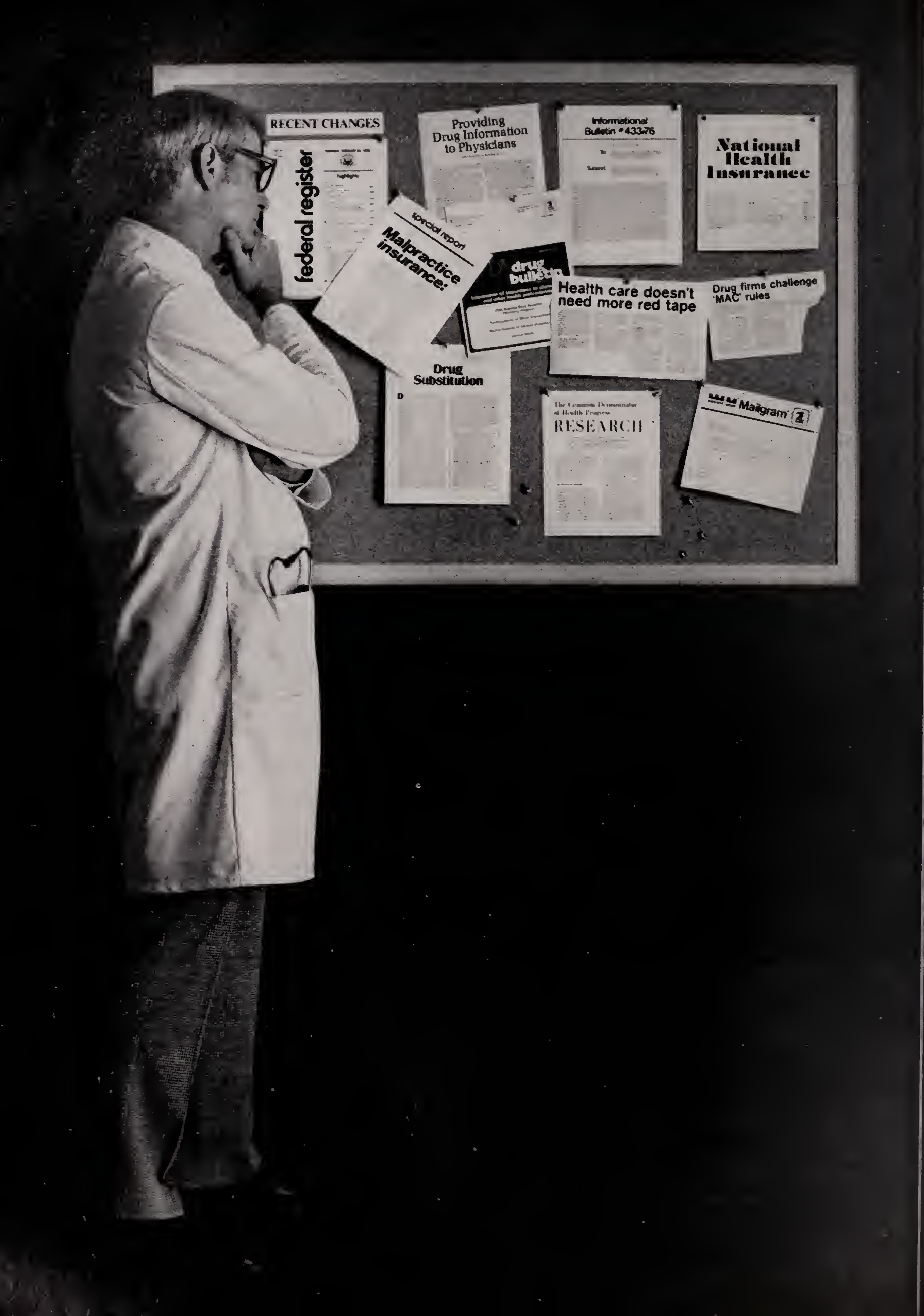
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Problems Encountered by Nurse Practitioners in a Senior Citizens' High-Rise Clinic

ROBERT A. DERRO, M.D.*

The composition of a nurse practice located in a senior citizens' hi-rise residency was determined. Hypertension and chronic cardiac diseases accounted for 33.8% of all problem encounters. The problem frequency profile reflected chronic but often stable illnesses common to the elderly. The provision of a nurse practitioner-staffed clinic facility for elderly residents of age-segregated housing units is an appropriate alternative for dealing with many of their health care needs.

STUDIES HAVE SHOWN that appropriately trained nurse practitioners can effectively provide a variety of health care services to adults in variable clinical settings, such as a suburban private practice,[1] a university-affiliated outpatient clinic,[2] and an automated health appraisal unit.[3]

Since 1972, the University of Minnesota School of Public Health, Public Health Nursing Program has trained a number of registered nurses to function as Adult/Geriatric Nurse Practitioners.[4] Since 1973 a graduate of that program has been providing primary care and/or supportive services to the residents of a senior citizens' hi-rise facility on St. Paul's Lower Eastside. Her services have also been available to individuals aged 60 and over living in the surrounding community.

In an attempt to more accurately define her patient care responsibilities and to assist in developing a program of relevant continuing education, a daily logbook of each problem encountered and dealt with in the clinic in 1975 has been maintained. The data on problem types and frequencies obtained constitute the basis of this report.

The Clinic Setting

In a pioneering effort to incorporate a health care capability into a senior citizens' hi-rise residency, the Housing and Redevelopment Authority of the City of St. Paul included space for a clinic facility in the original construction plans. The HRA and the Ramsey County Commission, also agreed to include the provision of supplies and medical services by the Department of Family Practice at St. Paul-Ramsey Hospital and the maintenance of the clinic facility by HRA. A close working relationship between the nurse practitioner and a Family Practice resident physician provides for a teaching and service joint-practice model. Overall supervision and additional support are provided by the author.

Two hundred thirty-eight individuals live in the Hi-rise. Of these 156 were seen in the clinic on at least one occasion in 1975. Twenty-four residents received all their primary care in the clinic. The remaining 132 and in addition 134 individuals living in adjacent areas of the community were provided limited services, generally in support of and at the direction of their physicians. The average ages for the resident and nonresident groups were 70.7 and 72.8 years respectively. 69.7% of all clinic patients were female. The percentage for nonresidents was 63.4%, somewhat lower than that for residents which was 75%.

Results

Two thousand seven presenting problems were recorded in the course of 1,157 patient visits, with an average of 1.4 problems identified and dealt with per visit. The average number of visits per patient was 7.4 for residents and 2.4 for nonresidents. The medium number of visits per patient was significantly lower in the two groups, 3.2 for the residents and 1.5 visits per patient for the non residents. These latter figures reflect the fact that 56.6% of all patients were seen on only one or two occasions during the year, most often for purposes of influenza immunization, blood pres-

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TABLE 1

Fifty Most Commonly Encountered Problems In Rank Order Frequency—1975

ROF	Problem Description	Frequency of Encounter	No. of Individual Patients
1.	Hypertension	499	150
2.	Obesity	152	19
3.	Influenza Immunization	114	114
4.	Diabetes	103	18
5.	Blood Pressure Recording	102	79
6.	Depression	54	16
7.	Osteoarthritis	43	16
8.	Health Care Counseling	42	39
9.	Arrhythmia, Other	38	14
10.	Congestive Heart Failure	35	9
11.	Health Care Maintenance	35	24
12.	Chest Pain, NOS[*]	30	12
13.	Urinary Incontinence	28	4
14.	Skin, Other	28	25
15.	Medication Counseling	25	15
16.	Atrial Fibrillation	24	7
17.	Chronic Obstructive Pulmonary Disease	24	6
18.	Angina Pectoris	22	10
19.	Anemia, NOS	22	9
20.	S/P Cerebrovascular Accident	21	5
21.	Medication Refill	21	14
22.	Sclerodermatous Skin Lesion	20	1
23.	S/P Surgical Procedure	20	9
24.	Urinary Tract Infection	19	9
25.	Dermatitis Non-specific	19	12
26.	Renal Insufficiency	17	1
27.	Skin Ulcer NOS	16	7
28.	Hypothyroidism	15	7
29.	Abdominal Pain	15	9
30.	Financial Counseling	15	6
31.	Hearing Loss	14	7
32.	Cellulitis	14	8
33.	Weight Recording	14	7
34.	Pain, Extremity or Trunk, NOS	13	7
35.	Minor Trauma	13	9
36.	Dizziness	12	7
37.	Hepatomegaly	12	5
38.	S/P Myocardial Infarction	11	4
39.	Impacted Cerumen	11	5
40.	Headache, NOS	10	10
41.	Arteriosclerotic Heart Disease, Other	10	5
42.	Major Trauma, Including Fracture	10	7
43.	Anticoagulant Therapy	10	1
44.	Nausea and/or Vomiting	9	4
45.	Upper Respiratory Infection	8	4
46.	Myringitis	8	4
47.	Diarrhea	8	3
48.	Corns and Callosities	8	5
49.	Hypokalemia	8	5
50.	Hyperuricemia	8	6

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[*] Not Otherwise Specified

sure recording, and single-episode counseling. This pattern was especially evident among the non-residents, only 23.1% of whom were seen more than twice. Conversely, 49 individuals were seen from 9 to 55 times during the year which represents 50% of all patient visits.

The 50 most frequent presenting problems are listed in Table 1 in decreasing order. Hypertension was diagnosed in slightly more than half of all subjects on the basis of a blood pressure ≧160/95 mm Hg and/or a patient-related history, and accounted for ¼ of all the problems. Obesity, influenza immunization, diabetes, and blood pressure recording comprised an additional 23.5%. 91.1% of all visits were contained within these 50 problem descriptions. There is an expected variability of the relationship between frequency of clinic visits and the number of different patients seen for a given problem.

In Table 2, all problem areas are grouped into 13 disease categories. The number of immunizations for influenza and the frequency of problems requiring some form of counseling account for the high rank order of Supplementary Classifications. Obesity and diabetes comprise the great majority of endocrine and nutritional problems. Otherwise, the data clearly illustrate the dominance of cardiac and/or vascular problems in the practice profile.

TABLE 2

Disease Category Profile in Rank Order Frequency

ROF	Disease Category	Frequency of Encounter	% of Total
1.	Cardiovascular Diseases	678[*]	33.8
2.	Supplementary Classifications	310[#]	15.4
3.	Endocrine, Nutritional and Metabolic Diseases	270	13.5
4.	Diseases of Skin and Subcutaneous Tissue	135	6.7
5.	Diseases of Genitourinary System	99	4.9
6.	Diseases of Nervous System and Sense Organs	94	4.7
7.	Diseases of Digestive System	82	4.1
8.	Mental Disorders	78	3.9
9.	Signs, Symptoms and Ill-defined Conditions	76	3.8
10.	Diseases of Musculoskeletal System and Connective Tissue	75	3.7
11.	Diseases of Respiratory System	53	2.6
12.	Diseases of Blood and Blood-forming Organs	31	1.5
13.	Injuries and Adverse Effects	26	1.3
		2.007	

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[*] Blood Pressure Recording (n = 102) omitted.
[#] Weight Recording (n = 14) omitted.

Discussion

The composition of the nurse practice described in this study is affected by several factors: (1) residents of the hi-rise facility must be able to largely care for themselves. Consequently, individuals with active and serious diseases tend to be excluded from such dwellings, (2) most of the elderly residing in the facility or in the surrounding community who have serious medical problems maintain a relationship with a practicing physician. Such individuals, should they seek care in the hi-rise clinic, would more likely come to the nurse practitioner with health care needs unrelated to their more serious illnesses (3) the presence of a number of symptoms and physical signs in Table 1 indicates a level of diagnostic capability entirely appropriate to the nurse practitioner's function and role. Further in this regard, the frequently necessary reliance on patient history alone makes difficult or impossible computation of accurate disease prevalence rates, (4) as can be expected in a practice limited to the elderly, problem frequency profiles will be inordinately influenced by those individuals with illnesses which require frequent care.

Nevertheless, data on problem types and frequencies obtained in the manner described here are consistent with the level of sophistication at which the nurse practitioner is identifying and dealing with such problems. Such data have clear implications for continuing education of the health provider. For example, hypertension, obesity, diabetes and depression comprise 40.3% of all problem encounters. Each of these has significant prognostic implications and, to a variable degree, is capable of being modified by therapeutic intervention. It would therefore be appropriate for the nurse practitioner to remain abreast of new knowledge on these illnesses, in order to maintain and improve her skills in diagnosing and treating them. In this clinic, the practice profile has served as the basis for forms and procedures developed for weekly chart audit, for the acquisition of relevant written and audiovisual educational materials, and for the nurse practitioner's attendance at appropriate medical meetings.

The provision of age-segregated, rent-restricted housing over the past decade to older adults has been in response to the urgent economic needs of the elderly. The demand for this type of housing will probably increase as the proportion of people aged 65 and over continues to increase.[5] The provision of primary care and/or physician-supportive services in such housing units can assist in removing some of the physical barriers to health care so common to the aged. The data reported here indicate that those problems most frequently encountered in one such on-site clinic facility lend themselves well to diagnosis and management by a properly supervised nurse practitioner.

Acknowledgment

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References

1. Sackett DL, Spitzer WO, Gent M, et al.: The Burlington randomized trial of the nurse practitioner: health outcomes of patients. Ann Intern Med, 80:137, 1974.
2. Spector R, McGrath P et al.: Medical care by nurses in an internal medicine clinic. JAMA, 232:1234, 1975.
3. Taller SL, Feldman R: The training and utilization of nurse practitioners in adult health appraisal. Med Care, 12:40, 1974.
4. Vraspir EA, Cooley E, Williams G: Adult/geriatric nurse practitioners in Minnesota. Minnesota Med, 59:203, 1976.
5. Illustrative Population Projections for the United States: The demographic effects of alternate paths to zero growth. (DCOM Series P-25, No. 480) Washington, DC Government Printing Office, pages 4-6, 1972.

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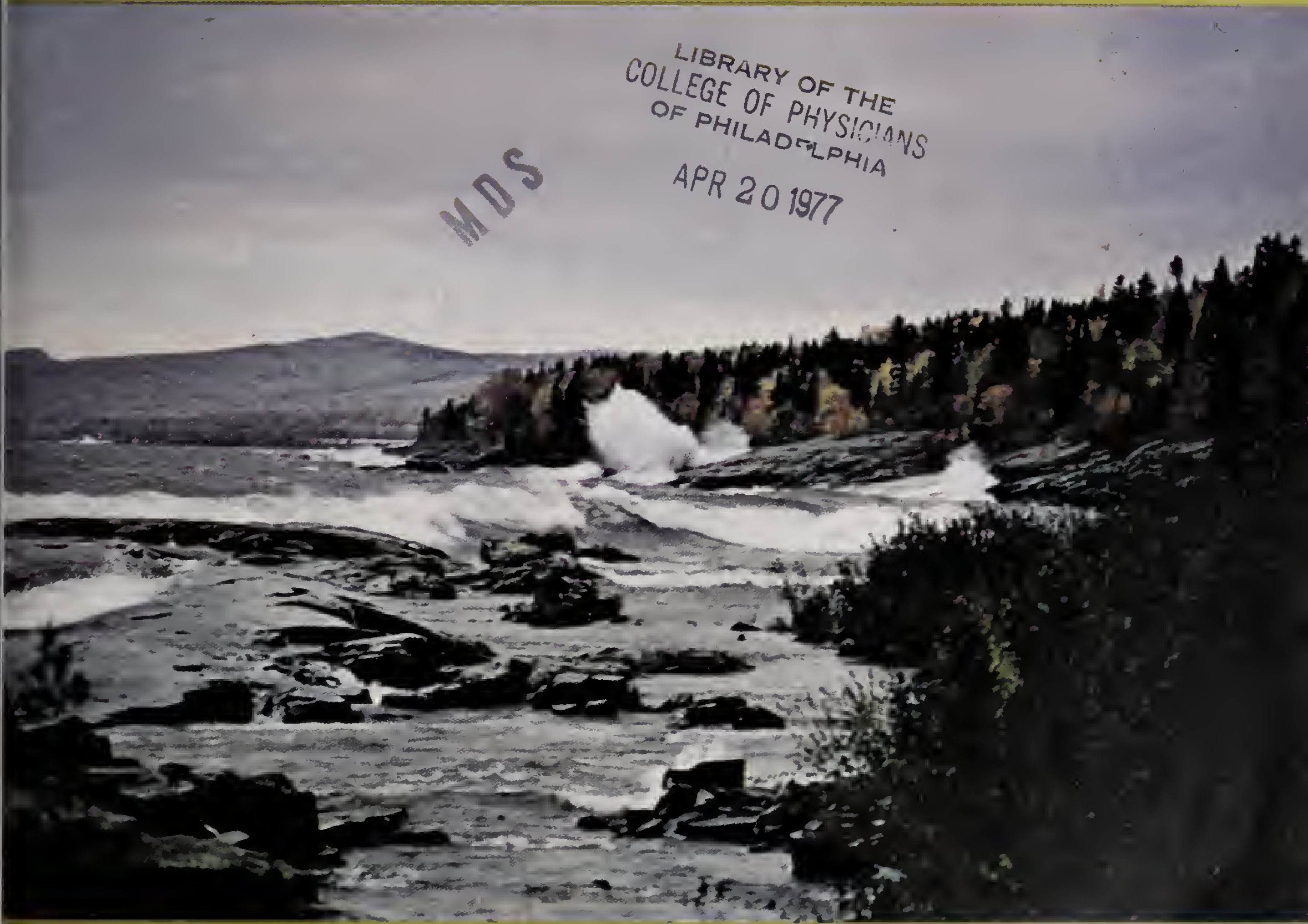

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Charles G. Sheppard, M.D.

APRIL, 1977

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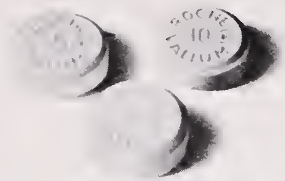

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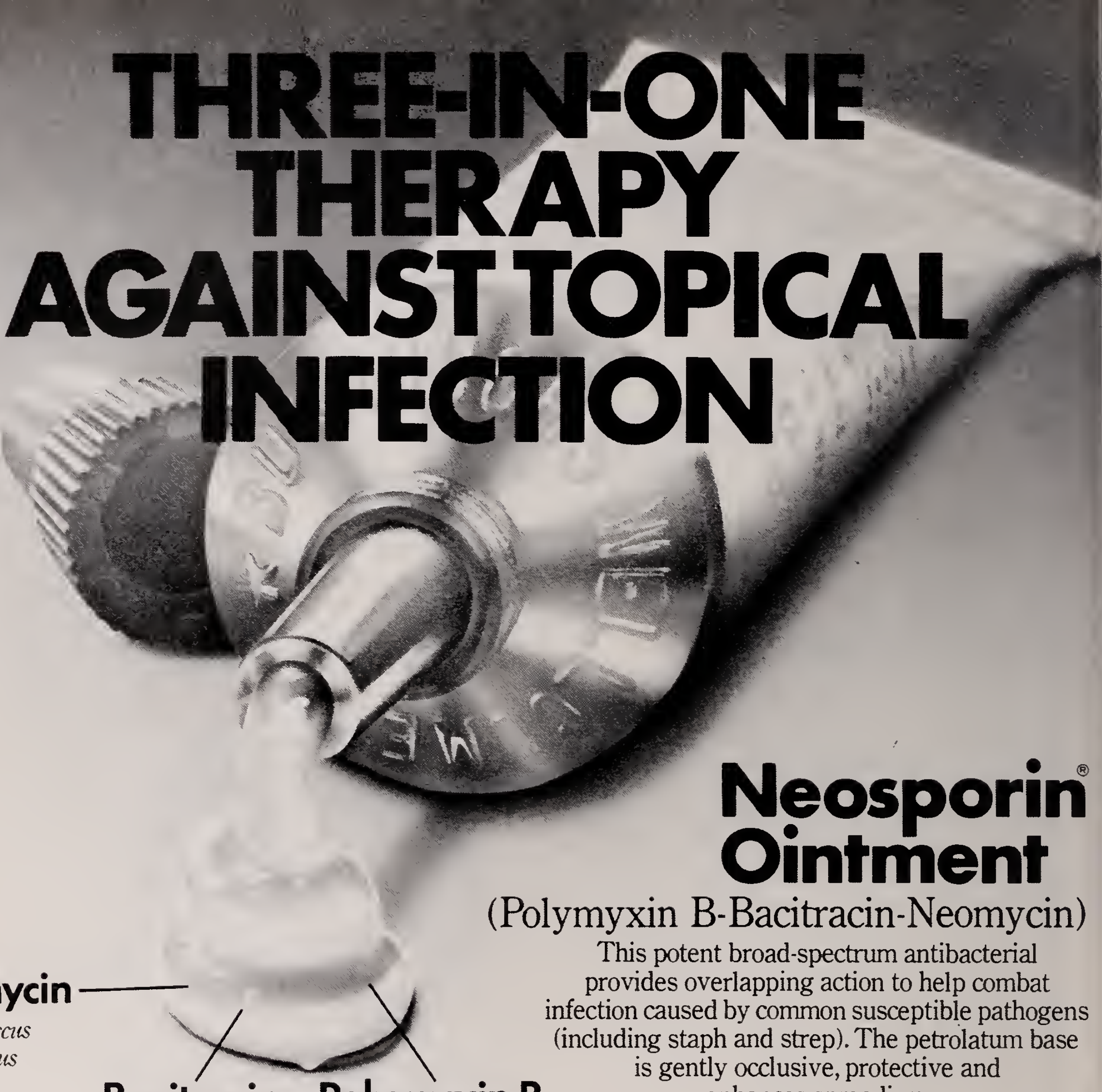

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President's Letter

Major testimony presented to the Minnesota House Subcommittee on Health Care on February 10, 1977 regarding the professional liability insurance crisis in Minnesota.

Mr. Chairman,

I am Doctor Richard Anonsen, President of the Minnesota State Medical Association and a family physician in private practice in Minneapolis.

I want to begin by thanking the Subcommittee for this opportunity to present an overview of the professional liability insurance problem here in Minnesota.

Physicians in Minnesota, like their colleagues throughout the country, are facing a professional liability insurance crisis that literally threatens their ability to stay in practice in some instances and in all instances—places a heavy financial burden on our patients who must ultimately pay for the escalating premium cost imposed on physicians and hospitals.

I think that it is important for us to emphasize this point. The tremendous costs of an outmoded system of professional liability claim settlement ultimately rest on the consumer—thereby contributing one additional factor to the escalating costs of health care. Let me illustrate. Nationally, $1.24 of each patient office visit charge in 1975 went towards paying for medical malpractice insurance, or 8.1% of the full amount the patient paid for the visit.

Compare this $1.24 per office visit in 1975 to thirty cents per office visit in 1973 and you get some idea of the rapid increase we have experienced in just two years, and additional increases can be predicted because professional liability insurance rates are still on the upswing in all states.

Actually, we should all be pleased that we are somewhere in the middle of the range between the states that have had a severe crisis in the past two years and those that have had few problems. In some parts of the country we have seen insurance carriers withdrawing from the market leaving whole groups of physicians and hospitals without any coverage. In other states the availability of coverage has become a moot point when annual premiums reach $40,000 and beyond.

Fortunately, a full blown professional liability crisis has not yet hit Minnesota. But then, only a few years ago no crisis was recognized in states like California, New York, Maryland, Indiana, Ohio, Michigan, Illinois—and I could go down the list. Insurance carriers announced that they could no longer write insurance in these markets. Is the handwriting on the wall for Minnesota? We believe that it is and that it is incumbent on this profession and this legislature to do everything possible to avoid what occurred in states like California and New York.

During the past two years some 44 states have enacted over 331 bills ushering in professional liability law reform. This legislature, unlike 44 states, has not enacted tort reform. But the point is, these states did not act until the crisis was upon them—and then in some cases, we believe acted hastily in the enactment of legislation some of which has been overturned by state supreme courts.

It has been said that these 44 states would not have acted in the absence of an immediate crisis. I think that is unfortunate and we are hopeful that here in Minnesota we can act now with foresight.

The Minnesota State Medical Association will, again, be proposing a package of tort reform bills which we believe are reasonable and that can be logically shown to provide a means of reducing the costs inherent in the professional liability insurance system in Minnesota.

We commend the Minnesota legislature for taking the initiative in the last session to address the possibility of an availability crisis of insurance coverage by the enactment of a Joint Underwriting Authority. The Minnesota State Medical Association along with the office of the State Insurance Commissioner strongly supported this measure which would create a temporary "Joint Underwriting Association" to provide medical malpractice insurance to physicians and hospitals should the private insurance market be unwilling or unable to provide this coverage. I am sure that we all share the hope that this emergency measure will not need to be implemented. In all states where a JUA has been implemented to provide emergency, short-term coverage, premium rates have significantly increased over the rates offered by the private insurance carriers.

It should also be noted that a Joint Underwriting Association, while it does provide emergency coverage of professional liability insurance, does not attack the problems which caused the implementation of a JUA in the first place.

Some state medical associations have formed their own insurance companies to provide professional liability insurance to their members. While this is another way of resolving the availability problem, it too does nothing to address the problem which created the availability crisis.

We want to emphasize that Minnesota does have the luxury of a little time to delay and hopefully avoid altogether the crisis that has been thrust upon the profession and public in other parts of the country. To do that, we will need to go beyond the enactment of a Joint Underwriting Association and enact tort liability remedial changes in this 1977 legislature.

And yet, there are still those who would say that Minnesota does not have a problem or even a potential one. Let's look at some of the facts that have contributed to the escalating cost of malpractice insurance in this state and the outlook for the future.

First, it should be noted that one indicator of whether or not we have a problem is in the frequency of reported claims. St. Paul Fire and Marine, which underwrites approximately 95% of all physicians in Minnesota, report that the number of claims reported in 1971 was 149. It climbed to 224 in 1972; 199 in 1973—then an astronomical jump to 305 in 1974—to 330 in 1975 and in 1976 it jumped from this figure of 330 to 415.

Physicians have seen a steady rise in their premiums over the years. In 1975 St. Paul Fire and Marine moved away from the traditional occurrence type policy to a claims-made policy. Once an individual physician goes on a claims-made policy, it takes five years for him to reach the mature rate which is somewhat similar to the occurrence rate if that policy were being offered. During the first year of a claims-made policy, the Company is only responsible for claims that arise during that one year, hence the premium is much lower. During the second year, the premium increases because the Company is covering for a two year period, and this progression continues until the end of the fifth year when the rate reaches its mature level. What all this means is that each year during the first five years of our claims-made policy, we will experience a projected rate increase for each one of those years. It is true, however, that on the basis of the first year's experience with a claims-made program, St. Paul has been able to reduce the projected average increase by 18.3%, but it is important to recognize that here still are significant increases for physicians in Minnesota for each year until 1980. The actual rates of increase will be based on experience which means that this five year projected schedule could be increased at any time. Beyond 1980, the rates will be determined by experience.

Another contributing factor to the increased cost of premiums for many physicians in Minnesota, was the change that St. Paul made from a five classification system to seven classes as recommended by the National Association of Insurance Commissioners. Class 1 represents the lowest risk specialties and class 7 includes physicians doing the highest risk procedures. In moving to this seven classification system, many physicians doing no surgery and having been classified in class 1, were moved to class 3 as a result of performing minor procedures such as needle biopsies. In addition, an individual in family practice in a rural area doing occasional anesthesiology in a small hospital, would automatically be rated to class 5 in which all anesthesiologists are placed. The upshot of this reshuffling system has been a steep increase in premiums for many physicians in addition to the projected increase which physicians expect during the next five years.

As an example of the five year projected rate increase, let's take an orthopedist who is classified in class 7 during the first year of his claims-made policy. The premium for one million dollars worth of coverage (the standard amount of coverage usually required by physicians) would cost $4,110 the first year—$6,554 in the second year $8,344 in the third year—$8,716 in the fourth year and maturing in the fifth year at $8,894.

As steep as these rates are, we are afraid that we have only seen the beginning.

Therefore, in addition to the enactment in the last session of a JUA bill to insure availability, we are proposing a package of tort reform bills for your consideration.

While I will not get into the specific points of the bills we are sponsoring in this session today, I do want to indicate the types of bills that we are recommending and the states around the country that have enacted similar provisions.

The seven states of Arizona, California, Delaware, Kansas, New York, Rhode Island and Washington have enacted a *collateral source rule* similar to the one we are proposing. This statute would permit the introduction into evidence at a trial that a patient has been compensated or reimbursed for his injury from another source such as private health insurance or workers' compensation insurance. In Minnesota, this type of evidence is not permitted to be presented before a jury and as a result, plaintiffs often receive double compensation for the same injury. The intent of our bill is to merely permit the court's discretion to set the amount of the award, taking into consideration the amount of compensation already received from other sources. Nine additional states have enacted a collateral source rule which goes beyond our proposal by mandating the court to reduce the amount of the award by compensation already received.

The Minnesota State Medical Association is also sponsoring a *periodic payments provision* in the statutes. Ten other states have already adopted such a provision. They include Alabama, Alaska, California, Delaware, Florida, Kansas, Maryland, New Mexico, Washington and Wisconsin. This would simply permit the court to award a settlement on the basis of a periodic payment schedule agreed upon by the parties rather than the payment of the full award in one lump sum. We think the courts should have this statutory, discretionary authority.

We are also sponsoring a better definition of *informed consent* which would ask that only physicians in like specialties treating patients a majority of the time in the same or similar area are competent to testify in a malpractice suit as to whether or not informed consent has been given in accordance with recognized standards of care in the community.

Another bill will be introduced to codify the *standards of care* which health professionals must adhere to and be measured against in any malpractice litigation. Fourteen states have enacted provisions relating to the standard of care.

As deterrent to the filing of non-substantive or frivolous suits, we will sponsor legislation to permit the filing of *counterclaims* in the same action. We believe that physicians should have the statutory right to file a counterclaim immediately in the original action if they have been victims of frivolous medical malpractice suits.

Finally, a bill will be introduced to authorize the court to award costs to a successful defendant if the action is dismissed as non-meritorious.

We hope that you will support these remedial provisions in the Minnesota tort liability statutes, and we look forward to presenting testimony on each of these specific bills.

We want to emphasize today that the Minnesota State Medical Association does not believe that changing the tort liability system will completely resolve the problem or prevent the kind of catastrophe that occurred in California, New York and some other states. It is only one piece of the puzzle but it is an essential piece.

Equally important is the determination of the medical profession to do everything possible to insure the competence of physicians.

We supported provisions in Chapter 222 enacted by the 1976 legislature strengthening the hand of the Board of Medical Examiners as it relates to medical competence. Under this legislation, professional liability insurers are required to report malpractice suits filed against physicians. Physicians applying for a Minnesota license who have previously practiced medicine in other states will be required to submit a five year malpractice history. Also the legislation requires hospitals which limit or suspend practice privileges of a physician on its staff to notify the Board of Medical Examiners of such actions. I repeat, these and other quality control measures have had the total support of the Minnesota State Medical Association.

In addition, we supported the provisions of Chapter 222 which authorize the State Board of Medical Examiners to develop and implement a continuing medical education requirement as a condition for relicensure in Minnesota. The Minnesota State Medical Association has been working closely with the State Board of Medical Examiners in the development of continuing medical education requirements for all physicians practicing in Minnesota. It is anticipated these regulations will be approved and adopted before the end of this year.

An additional responsibility of this profession, as we see it, is to avoid suits whenever possible by instituting risk management procedures in hospitals and in the physician's office. This is a whole new field and one which we believe holds great promise. In fact, we are in the process of developing a proposal for the development of a seminar program on practice management geared to the reduction of risks contributing to malpractice suits in the physician's office. We hope to report to you later on our progress in this innovative program. I think that one of the important benefits of this proposal will be the improvement of patient-physician relationships in the physician's office. It is my strong personal belief that a poor patient-physician relationship increases the likelihood of the filing of a frivolous suit. It is perhaps too simple to say, "You don' sue your friend," but there is a lot of truth in that statement. I can assure you that the medical profession in Minnesota will be pursuing this program during 1977.

Finally, we intend to develop a closer system of monitoring all claims filed in Minnesota from the moment they are filed until they reach dispositions. We need to develop a much better understanding of why claims are filed in the first place and how they might have been avoided.

Professional liability insurance is a crisis raging in all corners of this nation. We have been spared the disastrous aspects of this crisis for now, but there is no reason to believe that Minnesota won't undergo the crisis that occurred in Wisconsin, Indiana and other states similar in many respects to Minnesota. We have a unique opportunity that these states didn't have—time to make some remedial changes in the way in which we handle malpractice actions.

The Minnesota State Medical Association supports the legitimate need to thoroughly compensate patients who have been injured by an incident which has been judged to be malpractice. At the same time, we must bring reason to a system that has destroyed a viable insurance market in many parts of the country and restricted the right of physicians and hospitals to provide medical care to our citizens at a price that is not unduly loaded with the cost of an out moded professional liability insurance system.

On behalf of the Minnesota State Medical Association, I again want to express our appreciation for the opportunity of testifying before you today.

Richard E. Anonsen, M.D.
President
Minnesota State Medical Association

Minnesota State Medical Association

124th Annual Meeting

Minneapolis, Minnesota

May 19-20, 1977

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doesn't always come naturally

Big Balanced Rock, Chiricahua Mountains, Arizona (approx 1,000 tons)

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*INDICATIONS. Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

Effective: Management of nausea and vomiting and dizziness associated with motion sickness.

Possibly Effective: Management of vertigo associated with diseases affecting the vestibular system.

Final classification of the less than effective indications requires further investigation.

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Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

Usage in Children: Clinical studies establishing safety and effectiveness in children have not been done; therefore, usage is not recommended in the pediatric age group.

Usage in Pregnancy: See "Contraindications."

ADVERSE REACTIONS. Drowsiness, dry mouth and, on rare occasions, blurred vision have been reported.

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* **Indications:** When the fixed combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium-sparing action of its 'Dyrenium' component is warranted.

Contraindications: Further use in progressive renal or hepatic dysfunction; hyperkalemia. Preexisting elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs. Routine use of diuretics in otherwise healthy pregnancy.

Warnings: **Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired.** If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in severely ill patients with urine volume less than one liter/day, the elderly or diabetics, with suspected or confirmed renal insufficiency. Periodic determinations of serum K^+ should be made. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **The presence of a widened QRS complex or arrhythmia in association with hyperkalemia requires prompt additional therapy.** Thiazides are reported to cross the placental barrier and appear in breast milk; fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and other adverse reactions that have occurred in the adult may result. When used in pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics, or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium® (triamterene, SK&F Co.), and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Do periodic blood studies in cirrhotics to check for nondrug-related variations in blood pictures, and in patients with folic acid depletion, since 'Dyrenium' may contribute to appearance of megaloblastosis. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

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Editor's Notebook

editorial drift

dear doctors
my chief the editor
has fled to florida
to save his eyes
from minnesota s
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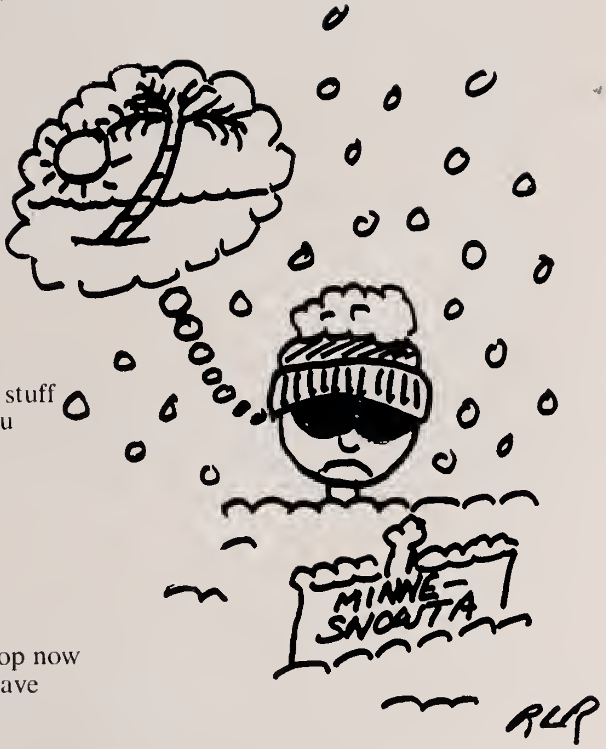


ps written at the height of the large snow storm

Woman's Auxiliary

to the

Hennepin County Medical Society

Minneapolis, Minnesota

Hennepin County Medical Society Auxiliary invites Minnesota Physicians to attend a benefit Antique Show, May 13, 14 and 15. The show and sale "From Buggy to Baroque," will be held at the Minneapolis National Guard Armory, 500 So. 6th St.

All proceeds will go to the Foundation of the Minnesota State Medical Association Student Loan Fund for medical school education. There is a great need for money to provide loans to needy medical students, and everyone has an opportunity to assist this Foundation. We encourage every Physician to support this event, either by participation or promoting it to other individuals.

A preview dinner will be held Friday evening, May 13th, 6:30-11:00 p.m. The evening will feature a filet mignon dinner, music by the Minnetonka Symphony Orchestra String Ensemble, silent auction, and preview of antiques for sale by over forty prominent dealers from the Midwest. Tickets are $25.00 ($15.00 tax deductible). If purchased by May 1st, they will sell for $22.50, $12.50 deductible). For tickets write: Mrs. William C. Woyda, 3607 Beard Avenue North, Minneapolis, Minnesota 55422.

Saturday show and sale hours are 11:00 a.m. to 9:00 p.m. On Sunday the hours will be noon to 5:00 p.m. Admission is $2.50. Special attractions will be demonstrations of candle making, weaving, stenciling, and chair caning. There will be an ID Clinic for any questionable antique you would like to bring to the show. All this plus a lovely door prize.

Saturday afternoon, at 1:30, there will be two lectures at the Hennepin County Medical Center (one block from the Armory). Thomas H. Murphy will speak on "Antiques as an Investment," and Donal O'Donnell Sr. will have a slide presentation of "Living with Antiques in Today's Life Styles." Admission for both lectures is $2.50.

Minnesota Society of Clinical Pathologists

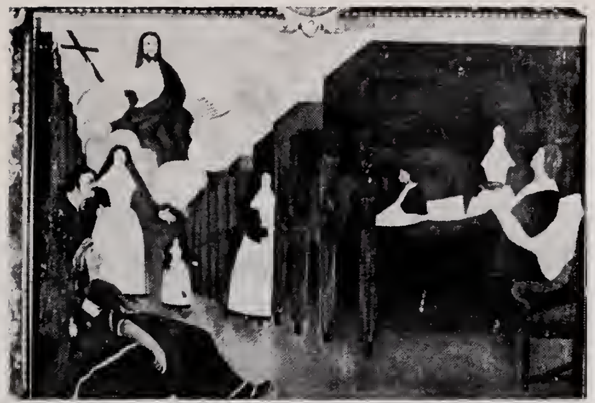
Symposium of the Lung

Saturday, April 23, 1977

Health Sciences Building, University of Minnesota

Tuition: $25.00 (includes luncheon, lecture summaries, and booklet of 35 mm. slides; dinner additional). Applications to: Wayne A. Chadbourn, M.D., Secretary, 900 South 8th Street, Minneapolis, Minnesota 55404. ASCP accredited for Continuing Medical Education.

L'Hôtel-Dieu de Montreal



Women's Ward of the Hôtel-Dieu in 1710. Primitive painting now hanging in the museum of the hospital convent.

More ancient than any hospital in the United States, the origin of the Hôtel-Dieu is so interwoven with that of the City of Montreal that their early histories are one. Jeanne Mance, the foundress of the hospital, was a member of the Compagnie de Montreal which landed at Villemarie on May 18, 1642, to found the city. She had sailed from France with the sole purpose of caring for the sick and wounded of the new colony, encouraged by promises of financial support from several French benefactors, most notably the widow of Richelieu's finance minister.

The first hospital building was completed in 1644, one of three large structures making up the original colony. It was constructed of wood, about sixty feet long by twenty-four wide, containing a room for Mlle. Mance, another for servants, and two rooms for the sick, with an attached chapel. The site was about a ten minutes' walk from the fort, an exposed position which later made it vulnerable to attacks by hostile Iroquois.

From the very beginning the hospital was crowded by the sick and wounded, victims of pestilence and of the recurring battles with the Indians. It supported the colony in more than the usual sense, even at one point transferring a major part of its endowment to a fund which saved the entire colony from financial collapse.

As originally conceived by Jeanne Mance, the Hôtel-Dieu sheltered and nursed the poor free of charge. Donated lands and livestock, as well as monetary gifts, allowed the hospital to finance the free care. When the press of work increased beyond the single-handed capabilities of Mlle. Mance, she arranged for the Sisters of St. Joseph to join her, the original three nuns setting out from France in 1659. Under the terms of their association Jeanne Mance retained her position as administrator of the hospital and its funds for the poor until her death in 1673.

After a disastrous fire in 1695 the hospital was rebuilt and enlarged, still on its original site at what is now the rue St. Paul and St. Sulpice. In 1861 it moved to its current location on St. Urbain and Pine Ave.

At present the Hôtel-Dieu de Montreal has 650 beds and functions as the teaching hospital of the University of Montreal. Title to the hospital is still held by the Congregation of Religious Hospitallers of St. Joseph, but under the prevailing health scheme its actual control is in the hands of the provincial government.

Warren L. Kump, M.D.
Minneapolis, Minnesota

References

1. Ann Med Hist V: 150, 1923.
2. Sr Corine Kerr of the Religious Hospitallers of St. Joseph: personal communication.

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Orbital-Antral Lymphoma

GEORGE G. HOHBERGER, M.D.;* ROBERT R. WALLER, M.D.;†
H. BRYAN NEEL III, M.D.;‡ and THOMAS J. McDONALD, M.D.‡

A 66-year-old woman had an orbital mass diagnosed as inflammatory pseudotumor. Subsequent roentgenographic studies revealed the presence of an antral mass and a lesion of the orbital floor. Biopsy of each mass showed well-differentiated lymphocytic malignant lymphoma. The patient's orbit was irradiated and the masses resolved; one and a half years after radiation therapy, no evidence of local or generalized lymphoma was found.

MALIGNANT LYMPHOMA USUALLY presents as a painless enlargement of one or more groups of superficial lymph nodes. However, one-third to one-half of all non-Hodgkin's lymphomas will present extranodally, the gastrointestinal tract and bone being the most common extranodal sites. Both the orbit and the maxillary antrum are infrequent sites for the presentation of malignant lymphoma. This report describes a patient who had a mass in the left orbit which was incorrectly diagnosed as inflammatory pseudotumor for three and a half years. The mass ultimately was discovered to be a well-differentiated lymphocytic type malignant lymphoma localized to the left orbit and maxillary antrum.

Report of Case

In December 1970, a 66-year-old woman visited her ophthalmologist because of a painless protrusion of the left eye of four months' duration. The left eye was proptosed 6 mm and there was a palpable mass in the inferior portion of the left orbit. Ocular examination was otherwise normal. A biopsy of the orbital mass was performed and the histologic sections were interpreted as inflammatory pseudotumor of the orbit (Figure 1). Because the patient had no functional or cosmetic deficit, she received no therapy. However, eight months later she was started on prednisone, 10 mg daily, because of a slight increase in the proptosis of the left eye.

In May 1972, the patient was referred to the Mayo Clinic for evaluation of persistence of the left orbital mass. Measurements with the Krahn exophthalmometer were 12 mm on the right and 19 mm on the left. Skull roentgenograms, including orbital views, were reported as negative. Chest roentgenograms and routine blood studies were also within normal limits. Slides of the biopsy specimen taken at the first hospital were reviewed and were interpreted as being typical of inflammatory pseudotumor, lymphoid type. It was decided that no additional therapy was indicated because the patient's vision was not threatened and her appearance was acceptable.

The patient returned in October 1972 for other surgery (cholecystectomy and thyroidectomy). Because her left eye had become increasingly proptotic since the last visit, consultation with the ophthalmology section was requested. Exophthalmometric readings showed a 6-mm increase in proptosis on the left side when compared with results of her previous examination five

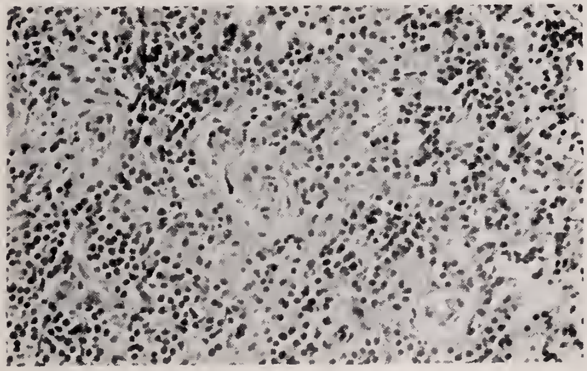

Fig. 1—Photomicrograph of biopsy specimen taken in 1970. Predominant cell is mature lymphocyte (small, dark-staining cells). Occasional plasma cell and several small capillaries are also seen in field. (Hematoxylin and eosin; reduced from x25.)

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†Department of Ophthalmology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

‡Department of Otorhinolaryngology, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

Reprint address: Dr. G. G. Hohberger, c/o Section of Publications, Mayo Clinic, 200 First Street SW, Rochester, Minnesota 55901.

months before. There was a palpable mass in the inferotemporal quadrant of the left orbit. It was thought that the mass should be biopsied again, but before the biopsy could be done the patient had her cholecystectomy and thyroidectomy. Both of these procedures were preceded by a steroid preparation consisting of cortisone acetate (200 mg intramuscularly for two days before and on the morning of surgery) and prednisolone sodium phosphate (40 mg intramuscularly on the morning of surgery).

Shortly after her two surgical procedures, the patient was seen again regarding the decision about the orbital biopsy. There was a remarkable reduction in proptosis which was thought to be attributable to her steroid therapy. This marked response of the mass to steroids seemed to confirm clinically the pathologic report that the mass was an inflammatory pseudotumor. Therefore, it was decided that an orbital biopsy would not be necessary and the patient was dismissed.

In May 1974, the patient returned with progressive proptosis of the left eye despite the use of systemic steroids in increasing dosages. Exophthalmometric readings were 14 mm on the right and 26 mm on the left. Orbital roentgenograms revealed a suspicious-looking area in the inferior portion of the left orbit (Figure 2). Tomograms of the orbits demonstrated a mass involving the orbital floor and the superior aspect of the maxillary antrum. Because of the involvement of bone, surgical exploration of the left orbit was undertaken. At surgery, a mass (20 x 10 x 5 mm) was noted to be eroding the bone of the orbital floor just medial to the infraorbital groove. A second mass (20 x 10 x 10 mm) was found in the inferotemporal orbit just posterior to the orbital septum. An incisional biopsy was taken from each mass. Histopathologic assessment of each biopsy specimen revealed malignant lymphoma of a well-differentiated lymphocytic type (Figure 3).

No evidence of generalized lymphoma was found during a complete medical examination. However, because of the patient's advanced age, bone marrow studies and lymphangiography were not done.

The patient's left orbit was irradiated with a total dose of 3,500 rads, after which the proptosis resolved rapidly. On her latest follow-up visit, 15 months after radiation therapy, her corrected visual acuity in the left eye was 20/30. The Krahn readings were 12 mm on the right and 14 mm on the left; and no tumor could be palpated in the left orbit. Orbital roentgenograms (Figure 4) revealed that the soft tissue mass noted in the left antrum had disappeared after radiation therapy. She had no evidence of generalized lymphoma.

Comment

There are three aspects of this case that we feel are particularly instructive and, therefore, justify its report. These are: (1) the unusual presentation of malignant lymphoma as a localized process involving the orbit and maxillary antrum, (2) the long delay in making the correct diagno-

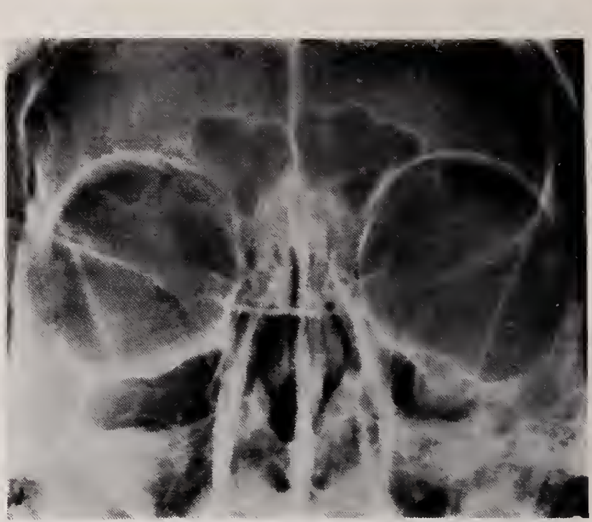

Fig. 2—Orbital roentgenograms taken in May 1974 before radiation therapy show soft-tissue mass in superior aspect of left maxillary sinus involving orbital floor.

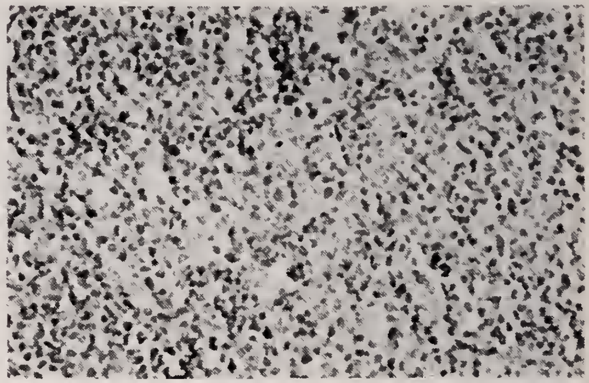

Fig. 3—Photomicrograph of biopsy specimen taken in 1974. There is diffuse sheet-like arrangement of small mature lymphocytes. Paler staining reticulum cells are also scattered throughout field. (Hematoxylin and eosin; reduced from x25.)

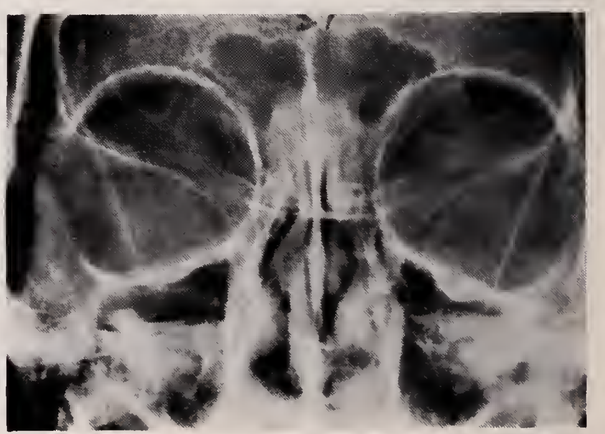

Fig. 4—Orbital roentgenograms taken in March 1975, 10 months after radiation therapy to left orbit, show that soft-tissue mass is gone.

sis, and (3) the relatively good prognosis of malignant lymphoma that is localized to the region of the eye.

Heath[1] reported on 1,600 patients with generalized lymphoma of all types and noted that in fewer than 1% was the orbit involved. Rosenberg and associates[2] reviewed over 1,200 cases of lymphoma (excluding Hodgkin's disease) and found the orbit to be the presenting site in only three cases. In 13 other cases, the orbit was involved as part of a generalized form of lymphoma. Further, they noted the maxillary antrum to be the presenting site in only six cases. By far the commonest cause of an orbital-antral mass associated with destruction of the orbital floor is a primary antral carcinoma that has extended into the orbit secondarily. This was the diagnosis that we considered most probable in our patient after orbital tomograms revealed an antral mass and a lesion of the orbital floor. At operation, we were surprised when the histopathologic interpretation of the frozen-section specimen was malignant lymphoma and not carcinoma. This meant that the patient would be spared the trauma of more extensive and perhaps radical surgery, because irradiation usually is considered the treatment of choice in primary malignant lymphoma of the orbit and the paranasal sinuses. This case demonstrates that malignant lymphoma can cause an orbital-antral disease process with destruction of bone and thus may be indistinguishable, clinically and roentgenographically, from primary antral carcinoma with orbital invasion.

The three and a half-year delay in making the clinical diagnosis resulted primarily from an inability to make the correct histopathologic diagnosis on two separate occasions. This fact emphasizes the difficulty that the pathologist can have in interpreting the histopathology of lymphoid lesions of the eye and its adnexa. The experienced pathologist usually can separate the obviously malignant from the obviously inflammatory in a group of ocular lesions clinically suggestive of lymphoma. However, in a certain number of cases the histopathologic features of the lesion lie somewhere between these extremes. Such lesions are composed almost exclusively of mature lymphocytes, which exhibit none of the disturbing cytologic characteristics of the obviously malignant lymphoma. When such a histologic picture is encountered, the differential diagnosis must encompass malignant lymphoma (well-differentiated lymphocytic type) versus benign, reactive, lymphoid hyperplasia. Hogan and Zimmerman[3] mention three general histologic features that characterize benign, reactive, lymphoid hyperplasia and that must be looked for in order to rule out malignancy: (1) polymorphism or an admixture of cell types; (2) formation of lymphoid follicles with germinal centers; and (3) the presence of ancillary evidence of inflammation. None of these features were seen in the present case. One must be cautious when the pathologic diagnosis is inflammatory pseudotumor; the possibility remains real that the patient may have a life-threatening disease.

Five years have passed since the discovery of a mass in this patient's left orbit and one and a half years since her radiation therapy. Fortunately, there has been no evidence of recurrent lymphoma. The patient's clinical course seems to support a concept that is prevalent in the literature—namely, that extranodal lymphoma localized to the eye and ocular adnexa has a much better prognosis than does lymphoma arising in cervical lymph nodes. A patient who has well-differentiated lymphocytic lymphoma that arises in a cervical lymph node has a 25% five-year survival rate and a median survival of 2.4 years.[4] On the other hand, Henderson[5] studied 16 patients with well-differentiated lymphocytic lymphoma localized to the orbit and noted a 70% five-year survival rate. McGavic[6] has found a 75% five-year survival rate and a 25% 15-year survival rate in a group of patients who presented with malignant lymphomas of various types about the eye and ocular adnexa. Interestingly enough, several studies[7,8] have calculated the five-year survival of malignant lymphoma that is localized to the paranasal sinuses to be between 50 and 70%. So it would seem that this patient's prognosis is relatively good.

But what are the chances that she will develop a local or widespread recurrence of her lymphoma? What are the chances that she will die as a result of her lymphoma? The only data available to answer these questions come from Henderson[5] and McGavic.[6] Both of their series are small and, therefore, conclusions from them should be drawn cautiously. In Henderson's series,[5] seven of the 16 patients developed additional foci of disease between 15 months and eight years after the original lymphoma had been treated. Four of the seven patients with recurrence of their lymphoma died, two as a result of disseminated lymphoma; in the other two patients, death was attributed to causes other than lymphoma but, at autopsy, widespread lymphomatous disease was found. In the McGavic series,[6] seven of 14 patients with lymphoma localized to the region of the eye went on to develop generalized lymphoma.

So it would seem that this patient's neoplastic process has been arrested, at least for a time. The follow-up period has not been long enough to enable us to consider her cured. At her advanced age, she probably has better than a 50% chance of living the remainder of her life without experiencing a recurrence of her lymphoma. However, she will require continued, regular follow-up to ensure early detection and treatment of any new foci of lymphoma that may appear.

References

1. Heath P: Ocular lymphomas. Amer J Ophthalmol 32:1213, 1949.
2. Rosenberg SA, Diamond HD, Jaslowitz B, et al.: Lymphosarcoma: a review of 1269 cases. Medicine (Baltimore) 40:31, 1961.
3. Hogan MJ, Zimmerman LE: Ophthalmic Pathology: An Atlas and Textbook. Second edition. Philadelphia, WB Saunders Company, p 767, 1962.
4. Aisenberg AC: Malignant lymphoma. New Engl J Med 288: 883, 1973.
5. Henderson JW: Orbital Tumors. Philadelphia, WB Saunders Company, pp 345-381, 1973.
6. McGavic JS: Lymphomatous tumors of the eye. Arch Ophthalmol 53:236, 1955.
7. Eichel BS, Harrison EG Jr, Devine KD, et al.: Primary lymphoma of the nose including a relationship to lethal midline granuloma. Amer J Surg 112:597, 1966.
8. Sofferman RA, Cummings CW: Malignant lymphoma of the paranasal sinuses. Arch Otolaryngol 101:287, 1975.

Continuing Medical Education
University of Minnesota

Maxillofacial Trauma, April 15-17

This course is sponsored by the American Academy of Facial Plastic and Reconstructive Surgery. This seminar will review the comprehensive surgical care of the maxillofacial trauma patient. Credit—22 hours. To be held at St. Paul Ramsey Hospital, St. Paul, Minnesota. Fee—$300.00.

Current Topics in Clinical Laboratory Science, April 20-23

This course is a conjoint venture between the Division of Medical Technology of the Department of Medical Technology of the Department of Laboratory Medicine and Pathology of the University of Minnesota and the Minnesota Society for Medical Technology. It is offered as part of a systematic approach to providing current data on techniques, applications, cautions, equipment and other specific competencies. Credit—15 hours. To be held at Mayo Memorial Auditorium, University of Minnesota, Minneapolis. Fee—$100.00.

Topics in Geriatric Medicine, April 28-29

Sponsored by the Department of Family Practice. To be held at Nolte Center, University of Minnesota, Minneapolis. (Further information to follow)

For further information on the above courses, contact the Office of Continuing Medical Education, University of Minnesota Medical School, Box 293 Mayo Memorial Building, Minneapolis, Minnesota 55455; Telephone: 612/373-8012.

Acute Supraglottitis

JOSEPH H. LEEK, M.D.*

We all feel anxious and tense when the telephone rings late at night, and we learn there is a patient in the emergency room with an airway crisis. This concern is not entirely necessary if the right course of action is followed when acute supraglottitis is suspected. Coordination and cooperation of several disciplines are necessary, but most important, between the surgeon who might be required to do a tracheotomy and a member of the anesthesiology department who might be required to give an anesthetic or intubate the patient.

EITHER THIS PROBLEM is on the increase or the diagnosis is being made more frequently; in any case, the problem is certainly more in the limelight than in former years. The early symptoms of acute supraglottitis are generally mild, usually those of an upper respiratory infection. There is a slight sore throat and possibly difficulty swallowing. The impending crisis usually is unsuspected. Within a few hours, however, severe symptoms can develop. The sore throat increases with marked pain and considerable difficulty swallowing.

The patient will be found sitting up, often with the jaw thrust forward and saliva drooling from the mouth. The patient will be apprehensive and appear sick. Both the temperature and the white blood cell count will probably be significantly elevated. In a recent review of cases with supraglottitis, the average time lapse from the onset of symptoms to the needed emergency room visit was about 14 hours.[1]

Examining the Patient

A dogma of sorts handed down through the years says that examining the patient with acute supraglottitis can precipitate an obstructive crisis. I suppose this is a possible risk in a patient with far advanced disease. I feel that fear of the examination and, therefore, lack of a diagnosis is the more dangerous route to take. *No diagnosis* and potentially inadequate care is the greater hazard.

Examination should not be done with the patient lying down; the patient will resist this position anyway. Using a tongue blade and flashlight might allow a peek at the epiglottis in a child but this technique is not invariably effective and could be potentially hazardous.

Also, the extent of the supraglottic pathology will remain unknown. If the person is sufficiently cooperative, grasping hold of the tongue and using a laryngeal and head mirror will afford an excellent appraisal of the epiglottis and possibly the entire larynx. Since the tongue thrust pulls the epiglottis forward, an airway crisis should be temporarily reduced. Seeing the cherry red, swollen epiglottis or arytenoids is stimulus to action.

Etiology and Differential Diagnosis

Although a foreign body can lodge itself in the supraglottis, this diagnosis should be reasonably easy to separate from an infectious disorder. The major diagnostic differential is acute laryngotracheal bronchitis and acute supraglottitis. Laryngotracheal bronchitis is usually of viral etiology; acute supraglottitis generally is bacterial in origin.

Depending on which report is surveyed, the bacteriologic statistics suggest that Haemophilus influenzae type B is the usual offender in supraglottitis.[1,2] Fifty to 65% of cases seem to be caused by this infection. Blood cultures are more likely to be positive than throat cultures. Acute laryngotracheal bronchitis is more common in the infant zero to three years of age.

Acute supraglottitis is likely to be seen in

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See editorial, page 266.

children over two and extending into the adult population. The patient with acute laryngotracheal bronchitis is usually not as toxic and the disease is not likely to reach crisis proportions as rapidly as in acute supraglottitis.

Medical Treatment

Medical care should be initiated promptly. This is best accomplished in the hospital. Using IV fluids and appropriate antibiotics are essential. Ampicillin is probably the antibiotic of choice but recently there have been several reported cases of Haemophilus influenzae resistant to Ampicillin.[2] Chloramphenicol either alone or with Ampicillin might be better. Increased humidity and oxygen in a croupette for the younger patients seem to be of value. There continues to be controversy about the effectiveness of cortisone for treating supraglottitis. Many observers feel cortisone is given as a drug of anxiety—anxiety on the part of the physician.[2,3] Most investigators state that using intermittent positive pressure with racemic epinephrine is of no value in acute supraglottitis.[3] In contrast, almost all reports now favor the use of this modality for laryngotracheal bronchitis.

If there is evident swelling and erythema of the supraglottis, don't wait to act.

Surgical Treatment

There is no consensus regarding the better means of establishing an airway in an obstructive crisis from supraglottitis. There are advocates for the use of endotracheal intubation, proponents for emergency tracheotomy, and those who like to consider each procedure as reasonable. Regardless of the choice you might have, I feel whenever possible, care should be given in the operating room with a surgeon, a member of the anesthesia department and an operating crew in attendance. I feel it is desirable to give an inhalation anesthetic, such as nitrous oxide and halothane, especially if respirations can be assisted. If it is possible to assist respirations, some investigators feel a muscle relaxant, such as Succinylcholine, is a safe and valuable adjunct.[4,5]

Endotracheal Intubation

If an endotracheal tube can be inserted, obviously the airway crisis is temporarily averted. Intubation tubes must be of the proper material and the proper size. The older intubation tubes had tin in them and were tissue-irritating. The endotracheal tube should be tissue-implantable. The usual description for these tubes is a Portex tube or a polyvinyl chloride tube. In addition, the diameter of the endotracheal tube to be inserted should be smaller than a tube that normally would be used in a patient receiving a routine anesthetic for surgery. It is desirable that there will be an air leak around the tube. The anesthesiologists tell me that a crude but fairly reasonable measurement of the ordinary tube size is the distal end of the little finger.

Nasotracheal intubation is preferred over orotracheal intubation but there is no contraindication to using the oral route. In fact, if there is a crisis situation, the oral route is probably desirable as insertion is more efficient. The polyvinyl endotracheal tubes tend to soften very rapidly as they become warm. Within 15 or so seconds inside of the nose or mouth, they can become somewhat like a wet noodle. For this reason, if there is difficulty with intubation a stiff stylet can be passed down the lumen of the tube to facilitate passage through the glottis.

For the advocates of tracheotomy, assisted respirations under general anesthesia and hopefully with an intubation system in place, will make the surgical procedure far less harrowing. It is perfectly reasonable to insert a rigid bronchoscope through the glottis before the tracheotomy. Although we all read about the cafe tracheotomy or the laryngotomy in a taxi cab, most surgeons don't feel comfortable having to consider, much less do, such a procedure. The tracheotomy can be a difficult operation even in the hands of an experienced surgeon, especially when asphyxia is imminent and time is of the essence.

The endotracheal or the tracheotomy tube should have no cuff around it. There is no need to seal off the lower airway below the glottis.

Postoperative Care

Humidity via a tent or ultrasonic unit is needed. A mucus plug obstructing the endotracheal tube system is much more of a concern than in a tracheotomy tube which employs an inner cannula. Care of the intubation system requires exceptional nursing service. Manipulating and migrating of the indwelling system will irritate the tracheal mucosa and possibly ulcerate it. The intubation tube or tracheotomy tube must be fixed securely to the patient, both to avoid accidental extubation and to avoid migration of the tube. Tracheal toilet should be frequent in the first few hours. After suctioning, a short burst of mechanical ventilation with a respirator will help to prevent atelectasis that can develop from suctioning.

Complications

Complications related to the disease are similar to all infections and problems related to anoxia.

The untoward effects of mechanical injury are similar in both endotracheal intubation and tracheotomy. The major morbidity initially is tracheal granulations. Months later there is the risk of laryngeal and/or tracheal stenosis. If the airway venting system is too large, has been of irritating material or there has been excessive motion of the system against the trachea, then mucosal irritation is likely. In addition, of course, there is the neck scar that results only from the tracheotomy.

Accidental intubation is a hazard regardless of which system is used but is far more of a crisis with tracheotomy than it is with an endotracheal tube. The tube forms a splint or stent which dilates the glottis and gives a little longer time lapse before the airway crisis returns.

Aftermath

As rapidly as the disease comes, so it seems to abate. In about two or three days, swelling will have subsided sufficiently to allow extubation. Checking the larynx using the laryngeal mirror or by direct visualization under anesthesia is appropriate to determine the safety of extubation. In several surveys, the time of hospitalization seems to be far less using an endotracheal intubation system. The usual hospital stay is two to three days in the intubated child and six to seven days in the tracheotomized child.[4,5]

Endotracheal intubation has been discussed as an alternative to tracheotomy in treating acute supraglottitis. Time and experience will assist in determining its effectiveness and safety.

References

1. Fearon B and Cirramond M: Tracheotomy in acute supraglottis. Laryngoscope, April, 1976.
2. Sweeney DB et al: Acute epiglottitis—management by intubation. Anesthesia and Intensive Care. 1:6, 1973.
3. Johnson GK: Acute epiglottitis. Arch Otolaryn 100(5):3307, 1974.
4. Battaglia JD: Management of acute epiglottitis by nasotracheal intubation. Amer J Dis Child 129:334-6, March, 1975.
5. Schuller DF: Safety of intubation in croup and epiglottitis. Laryngoscope 85(1):33, 1975.

Harold A. Diehl Award

The committee for the Diehl Award given annually by the Minnesota Medical Alumni Association solicits nominations for this award from the physicians of Minnesota. The award is presented to one or more physicians meeting these four major criteria:

1. Preferably an alumnus of the University of Minnesota Medical School.
2. Not engaged in an academic capacity.
3. Has made outstanding contributions to the Medical School, the University, the Alumni.
4. Have a relatively long experience in the field of medical science or a related field.

Nominations for the 1977 awards should be sent immediately to:

Konald A. Prem, M.D.
Chairman, Diehl Award
Box 395
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Metastatic and Nonmetastatic Involvement of the Nervous System Complicating Cancer

SIDNEY K. SHAPIRO, M.D., Ph.D.*

The remote and non-metastatic effects of cancer on the nervous system are reviewed. A patient suffering from a solitary cerebral metastasis and subsequently non-metastatic involvement of the nervous system is reported.

The spread of matastatic carcinoma to the brain has been well known to the profession for many years. Paillas and Pellet[1] have reviewed the frequency of reported series of brain metastasis and the incident varies from .5% reported by Bailey in 1948 to 26.9% reported by Courville in 1950, this last figure being based on a series of 40,000 autopsies. The remote effects of neoplasms on the nervous system have only in recent years become recognized and have not received the attention they deserve. In 1963, Croft and Wilkinson[3] in 250 male patients suffering from carcinoma of the lung, found an incidence of well developed neuromyopathy involving 6% of the patients. Croft and Wilkinson[4] studied the incidence of neuromyopathy in 1476 patients with carcinoma at various sites. The overall incidence of neuromyopathy was 7%.

The present patient is of considerable interest in that she suffered initially from a solitary mammary metastasis to the brain and at a later date from the remote effects of the neoplasm on her cerebellum.

Case Report

This female patient at the age of 39 had a right radical mastectomy for a mammary carcinoma (April 1969). At that time the axillary nodes were involved. The patient subsequently had 18 cobalt treatments. She remained asymptomatic until two years later when following an automobile accident, the patient developed stiffness of the ring and little finger of the left hand, and about a week later the additional symptoms of stiffness of the middle finger of the left hand. At that time Xrays of the cervical spine and electromyographic studies were within normal limits. The patient was subsequently found to have weakness of the left grip and a subjective hypesthesia involving the ring, little and middle fingers of the left hand. These symptoms persisted with some fluctuation but gradual improvement. On 9-29-71, the patient was admitted to the hospital following an episode of disturbance of sensation involving the whole of the left upper extremity followed by uncontrolled movements of the left upper extremity and then unconsciousness. On examination at this time there was diffuse weakness involving the whole of the left upper extremity with moderate weakness of grip on the left side. Position sense of the fingers of the left hand was absent and the remainder of the sensory examination was negative. The left biceps and left triceps reflexes were greater than those on the right. The Gordon and Oppenheim toe signs were positive bilaterally. The electroencephalogram was reported as midly abnormal electroencephalogram with some diffuse slowing. A brain scan on 9-29-71 reported an area of increased uptake over the right convexity peripherally consistent with a metastatic lesion. Spinal tap was negative for malignant cells. On 10-19-71, craniotomy was performed and a subcortical tumor about ¼ inch beneath the cortex in the right parietal lobe was resected. This tumor on microscopic examination was a metastatic mammary carcinoma. The patient postoperatively had a left hemiparesis. An oophorectomy was performed. The strength in the left leg returned rapidly and the strength in the left upper extremity improved. The patient was started on Mebroin† 1 tablet, three times a day and discharged on 11-16-71. At that time there was hyperreflexia on the left side. Position sense in the left upper extremity was impaired. There was mild weakness of the left lower extremity and moderate weakness of the left upper extremity with the most marked involvement being in the distal musculature of the left upper extremity. From November 16th through December 20th, 1971, the patient had 24 cobalt treatments delivered at 4500 r.a.d. tissue dose to the mid depth. The patient gradually improved and on 4-4-72 returned to work part-time.

Two weeks prior to her final admission to hospital on 5-4-73, she became lethargic, developed dysarthria and had difficulty with her balance. On admission to hospital, the patient was markedly dysarthric, had a marked trunkal ataxia and was unable to sit or stand without assistance. Marked incoordination of the hands and feet was present bilaterally. There was hyperreflexia on the left side with an extensor plantar response on the left, and residual weakness of the left upper extremity. The patient had marked elevation of serum calcium recorded during this last hospitalization with a value of 21 mgs. percent. The patient went rapidly downhill, became comatose and died on 5-9-73.

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†Mebroin—mephobarbital 90 mg., phenytoin 60 mg.

Post-Mortem Examination

Positive findings on post-mortem examination were: (1) metastatic mammary carcinoma to alveolar parenchyma, (2) metastatic mammary carcinoma in intrabronchial locations, (3) metastatic mammary carcinoma in the hilar lymph nodes, (4) 70% of the liver by volume was replaced by metastatic carcinoma. On microscopic examination metastatic mammary carcinoma of the liver was found and in some areas, there was central necrosis and fibrous replacement.

Bone marrow sections revealed evidence of microfoci of metastatic mammary carcinoma.

Brain: Gross Examination. There was thickening of the meninges underlying the site of the previous surgery. After appropriate fixation, the brain was sectioned. There was some atrophy of the right parietal area but there was no other asymmetry and there was no evidence of any metastatic carcinoma to any area of the brain. Multiple random sections through both cerebral hemispheres, cerebellum and brain stem were entirely negative.

The patient also was found to have metastatic calcifications over the kidneys, heart and focally in other soft tissue areas probably related indirectly to the osseous metastatic involvement.

Discussion

This patient is of considerable interest on two accounts. The first is the presnce of a solitary metastasis to the nervous system which was successfully resected and treated, resulting in 18 months of useful life to the patient. The second is the fact that when the patient finally succumbed in spite of marked cerebellar symptomatology, there was no evidence of any cerebral metastasis; the neurological symptomatology in this patient was due to the non-metastatic or remote effects of the carcinoma of the breast on the nervous system.

There is a paucity of literature on the incidence of solitary metastasis from the mammary gland to the central nervous system in the absence of metastasis elsewhere in the body. Five neoplasms which metastasize to the brain most commonly are carcinoma of the breast, lung, kidney, gastrointestinal tract and melanoma. A considerable amount of literature deals with the metastatic complications of carcinoma of the lung. The series of Richards and McKissick[5] based on neurosurgical material from 389 patients seen at St. George's Hospital from 1946 to 1960 gave an estimate of 65% of metastatic brain tumors originating from the bronchus as contrasted to 5.95 percent from the breast. The incidence rate of metastasis from mammary glands in relation to the total number of intracranial metastasis reviewed at nine institutions varied from 5% to 34%.[6]

Initially symptoms suggestive of brain metastases may occur intermittently over several weeks to months. However, in most patients the clinical course tends to be semi-acute to chronic. Patients with metastasis to the central nervous system from carcinoma of the breast usually die within a year of the appearance of generalized disease. It is generally agreed that secondary tumors of the brain are most often multiple and this holds true for those with bronchial origin. Russell and Rubenstein 1971[7] found solitary examples of metastasis from bronchogenic carcinoma in 30%. In only two of these cases were the solitary metastasis the only secondary growth found in the body although in six others, the extracranial deposits were restricted to hilar glands.

Although the usual course following cerebral metastasis is one of rapid deterioration, there are recorded exceptions to this clinical course which deserve mention. Two patients are reported who had a history of Jacksonian epilepsy starting 4½ to three years respectively before death and at post-mortem, posterior frontal metastases from carcinoma of the bronchus were found in both cases.[8] An interesting feature recorded in several publications is the existence of a latent period in some cases between the operative removal of the primary growth and a manifestation of a secondary deposit in the brain. In thirteen of Stortbecker's[7] cases, this exceeded three years and in 21 cases, one year, but the latent period in hypernephroma has extended for considerably longer, nine years in the case reported by Christenson[7] in 1949. ten years in a case reported by Stortbecker[7] and 13 years in a case of Richards and McKissick.[7] This, however. is not unique, for even longer periods have been observed after removal of the eye for malignant melanoma and in choriocarcinoma. This latency has long been recognized as a clinical enigma.[7] In some reported incidences, the cerebral metastasis is symptomatic long before the primary is discovered. In a case report by Russell and Rubenstein (1959),[9] a mass of secondary carcinoma was resected in 1948 from the left occipital lobe. Subsequent investigation of the chest proved negative but in 1952, he had a small hemoptysis with development of pain in the left upper part of the chest radiating down the left arm. The upper lobe of the left lung was then resected for an apical carcinoma. He then remained well until 1954 when he was readmitted with symptoms indicative of recurrent intracranial tumor. At necropsy a few weeks later, multiple subarachnoid and subdural deposits of growth were found over the surface of the brain.

It is not within the province of this paper to review treatment of cerebral metastasis from carcinoma. In a current review of this subject, Lokich[10] reviewed the management of cerebral metastasis which includes the use of neurosurgery, radiation and chemotherapy.

Fuller et al.[6] have reviewed their experiences in the treatment of metastatic carcinoma of the breast in 61 patients. Nine of their patients survived 13 months or longer. Three lived 13 to 18 months, one survived two years, one died at three years, one at 42 months and one at six years. Sixteen patients were treated primarily by neurosurgery and in this group, only one survived 13 to 18 months. Forty-five patients were treated primarily with radiotherapy and in this group, were the seven patients who survived longer than 13 months, as indicated above.

Stortbecker[2] reported the operative removal of the solitary metastasis from a hypernephroma with postoperative survival of the patient for 17 years. Occasional long term survivals of up to 15 years had been reported after removal of solitary recurrent metastatic melanomas.

The patient whom we have reported here is of interest in that her useful life was extended for 18 months. This patient exceeded the average life expectancy of patients with cerebral metastasis from carcinoma of the breast and this underlines the necessity for aggressive diagnosis and treatment of metastatic carcinoma.

The classification of nonmetastatic carcinomatous neurologic diseases modified from Brain and Norris[11] is presented in the Table. As indicated the neurological manifestations of carcinoma in which there is no direct involvement of the nervous system by metastatic carcinoma are manifold. The patient under consideration probably falls into the group of subacute cerebellar degenerations on the basis of nonmetastatic carcinomatous involvement. Unfortunately the cerebellum was lost to detailed histological study and no final microscopic studies with special stains were possible and a definitive diagnosis of subacute cerebellar degeneration cannot be made. The terminal hypercalcemia may have been a factor in the production of some of the neurological symptoms but this would be an unusual picture as hypercalcemia usually produces drowsiness, confusion or stupor and muscular weakness. Suba-

TABLE
Classification of Nonmetastatic Carcinomatous Neurologic Diseases

I. Encephalopathy
- **1. Multifocal leukoencephalopathy**
- **2. Diffuse encephalopathy**
  - **a. With mental symptoms**
  - **b. Subacute cerebellar degeneration***
  - **c. Brain stem lesions**

II. Myelopathy
- **1. Chronic myelopathy**
  - **a. Long tract degeneration**
  - **b. Long tract and neuronal degeneration**
  - **c. (including cases simulating motor neuron disease)**
- **2. Subacute necrotic myelopathy**

III. Neuropathy
- **1. Sensory neuropathy with dorsal column degeneration**
- **2. Peripheral sensorimotor neuropathy (polyneuropathy or neuritis)**

IV. Muscular Disorders
- **1. Polymyopathy**
- **2. Disorders of neuromuscular transmission**
  - **a. Myasthenic myopathy with paradoxical potentiation (Eaton-Lambert syndrome)**
  - **b. Myasthenia gravis**
- **3. Polymyositis and dermatomyositis**

V. Neurological Involvement Due to Disordered Metabolic or Endocrinal Functions or Nutritional Deficiency.
- **1. Hypercalcemia with or without bone metastases**
- **2. Hyperadrenalism**
- **3. Hypoglycemia**
- **4. Hyponatremia and water intoxication**
- **5. Hyperthyroidism**
- **6. Hyperviscosity states especially in macroglobulinemia (Bing-Neel syndrome)**

cute cerebellar degeneration is characterized by the rapid onset and progression of symptoms of cerebellar deficiency, that is, unsteadiness of gait. ataxia of the limbs and increasing dysarthria. Nystagmus may or may not be present. The patient is frequently bedridden, unable to feed himself and the speech may become unintelligible. The course is usually measured in terms of several months but it may have an acute onset as in this patient. In two of 17 cases reported by Brain and Wilkinson[12] the onset was acute, occurring in one of these patients after a night out drinking. In the series of Croft and Wilkinson[4] in which 1476 patients with carcinoma at various sites were studied, the incidence of neuromyopathy in women with carcinoma of the breast was 4.4%. The highest incidence of neuromyopathy was found in carcinoma of the lung (16 percent in men and 13 percent in women), and in ovarian carcinoma (16 percent). In patients with carcinoma of the rectum, cervix, and uterus, the incidence was 2% or less which is no greater than that of abnormalities found in a group of controlled patients without cancer.

Conclusions

1. A patient with carcinoma of the breast and a solitary cerebral metastasis is reported. The metastasis was successfully treated, and subsequently nonmetastatic involvemnt of the nervous system developed.
2. Attention is focused on the remote or nonmetastatic effects of cancer on the nervous system.
3. Some of the clinical aspects of metastatic carcinoma to the nervous system are reviewed and discussed.

References

1. Paillas JE and Pellet W: Brain metastasis, Handbook of Clinical Neurology, B. J. Vinken and G. W. Buryn, Vol 18, p 201.
2. Stortbecker TP: Metastatic tumors of the brain from a neurosurgical point of view; a followup of 158 cases. J Neurosurg 7:84, 1954.
3. Croft PB and Wilkinson M: Carcinomatous neuromyopathy; its incidence in patients with carcinoma of the lung and carcinoma of the breast. Lancet 1:184, 1963.
4. Croft PB and Wilkinson M: The incidence of carcinomatous neuromyopathy with special reference to carcinoma of the lung and breast in L. Brain and F. H. Norris, Jr., eds. The remote effects of cancer on the nervous system. (Contemporary Neurology Symposia I) New York, Grune, pp, 44-54, 1965.
5. Richards P and McKissick W: Intracranial metastasis. Br Med J 1:15, 1963.
6. Fuller LM, Levens ME and Eckles NE: Management of metastasis from carcinoma of the breast to the central nervous system and the eye. Chicago, Year Book Medical Pub., pp. 339-350, 1970.
7. Russell DS and Rubenstein LJ: Pathology of tumors of the nervous system. Baltimore, Williams & Wilkins, p. 265, 1971.
8. Rubenstein LJ: Tumors of the central nervous system in Atlas of tumor Pathology, 2nd series, Washington, D.C., Armed Forces Institute of Pathology, 1972.
9. Russell DS and Rubenstein LJ: Pathology of tumors of the nervous system, London, Arnold Press, p. 219, 1959.
10. Lokich JJ: The management of cerebral metastasis. JAMA 234:748, 1975.
11. Brain L and Adams RD: Epilogue: a guide to the classification and investigation of neurological disorders associated with neoplasms in L. Brain and F. N. Norris, Jr., Eds. The remote effects of cancer on the nervous system. (Contemporary Neurology Symposia I) New York, Grune, p. 217, 1965.
12. Brain L and Wilkinson M: Subacute cerebellar degeneration in patients with carcinoma in L. Brain and F. H. Norris. Jr., Eds. The remote effects of cancer on the nervous system. (Contemporary Neurology Symposia I) New York, Grune, pp. 17-23, 1965.

Cover Photograph

"Prelude to Spring"

Dr. Charles G. Sheppard, Medical Director of the Minnesota Security Hospital in St. Peter, took the cover photograph in 1970. The camera was an Eastman Kodak Reflex Retina III with a Retina-Tele-Xenar f:4/135 millimeter Schneider-Kreuznach long lens. Dr. Sheppard told the editors it was a dark day; there was quite a wind; and it had been raining. The place was Grand Marais, Minnesota, down along the beach.

Dr. Sheppard is a past-president of the Minnesota State Medical Association, has chaired many of the Association's committees, and is constantly working for the betterment of medical care for all peoples.

Fatal Meningococcemia and Meningitis Due to Meningococcus Group Y

ROBERT B. BREITENBUCHER, M.D*. and MOHAMMED Y. KHAN, M.D.*

Group Y strains of meningococci have previously been an infrequent cause of meningococcal disease. In the past two years the incidence of disease due to this organism has been increasing in certain military installations. Herein reported is a case of fulminant meningococcal disease in a 24-year-old black male civilian due to group Y meningococci.

SLATERUS DESCRIBED new meningococcal groups X, Y and Z in 1961.[1] Subsequently these groups have been identified in this country and others.[2-5] In 1967, Evans, et al. described two groups: 29E and 135.[6] Except for group Y, these new groups have been identified rather infrequently. They have been mainly identified only in carriers and have infrequently been associated with disease.[7] Since 1972, however, cases of meningococcal infection due to group Y have been reported with increasing frequency in certain military training centers.[8,9] We wish to report a fatal case of meningococcemia and meningitis due to group Y Neisseria meningitidis.

Case Report

A 24-year-old black male arrived at Hennepin County Medical Center on December 23, 1974 with a history of fever, headache, nausea, and vomiting of 14 hours duration. Towards the end of that period of time, he began to have backache, became lethargic, and was noted to be developing a rash on his chest, back, and arms. Except for one episode of childhood pneumonia, he had always been in good health. On examination, the patient was noted to be a well developed, well nourished black male who appeared to be lethargic but who could be aroused for questioning. His temperature was 38.3 degrees, C. (101 degrees, F.), orally, his pulse was 112 beats/minute, BP 114/86 mm. Hg. There was a hemorrhagic macular rash over the anterior chest, back, neck and face. There was some spontaneous horizontal nystagmus. Funduscopic examination was normal. Reflexes were normal and except for nuchal rigidity, the remainder of the physical examination was within normal limits. Hemoglobin was 15.4 gm./100 ml.; white count was 7,100/cu.mm with 66% neutrophiles and 34% lymphocytes; platelet count was 99,000/cu.mm; prothrombin time was 13.9 seconds (control was 10.8 seconds); partial thromboplastin time was 53 seconds (control was 34.8 seconds); thrombin time was 19.4 seconds (control was 14.2 seconds); fibrinogen 120 mg./100 ml. (N = 200-400). Serum sodium, potassium, chloride, CO$_2$ content, BUN and glucose were within normal limits. Examination of the cerebrospinal fluid (CSF) revealed a clear, colorless fluid with white cell count of 69/cu mm.; of which 96% were polymorphonuclear cells and 4% monocytes. Glucose in the CSF was 60 mg./100 ml (blood glucose was 111 mg./100 ml.). Gram stain was negative. Chest Xray was normal. A presumptive diagnosis of meningococcemia with meningitis was made and the patient was started on Penicillin G intravenously, 2,000,000 units every two hours. Additional therapy consisted of intravenous fluids with 0.5 normal Saline, 5% Glucose and 20 meq/L potassium chloride. The patient was given two units of fresh frozen plasma and 20 mg. phytonadione intravenously. During the first six hours that the patient was observed in the hospital blood pressure, respirations, temperature and pulse remained essentially the same as observed at the time of admission and except for some increase in lethargy, he clinically remained unchanged. After six hours, however, the patient suddenly developed a tachycardia of 150 beats/minute. Electrocardiogram showed nonspecific S-T changes with a sinus tachycardia. Except for tachycardia, vital signs remained unchanged until one half hour later when he suddenly developed a respiratory arrest followed by asystole which did not respond to resuscitative efforts.

Throat culture showed normal flora with no gonococci or meningococci identified on Thayer-Martin medium. Urine culture was sterile. Culture of the CSF revealed no growth. Three blood cultures taken prior to the institution of penicillin therapy all grew Neisseria meningitidis which was subsequently identified as group Y by the Center for Disease Control in Atlanta, Georgia. By disk susceptibility testing, using a modified Kirby-Bauer technique, the organism was sensitive to penicillin and chloramphenicol but resistant to gantrisin.

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See editorial, page 267.

Discussion

At present there are nine recognized groups of Neisseria meningitidis: A, B, C, D, X, Y, Z, 29E and 135. The groups are distinguished on the basis of polysaccharide capsular antigens. The frequency of identification of these groups varies from one locale to another as well as temporally. Prior to 1963, group A meningococcal strains were identified most commonly as the cause of epidemic meningococcal infections in the United States. After this, group B strains were almost exclusively the cause of meningococcal disease until about 1967 when these in turn were supplanted by group C organisms. These latter organisms were the predominant cause of meningococcal infection until 1970 when effective immunoprophylaxis against group C organisms in the military personnel was associated with a significant reduction in the occurrence of meningococcal disease caused by this organism.[10] During the period when group A was the predominant cause of meningococcal infections, these strains were almost always sensitive to the sulfonamide drugs. The advent of group B meningococci as a major cause of meningitis brought with it sulfonamide resistance for most of these strains and forced a reliance on penicillin for treatment. Subsequently, group B strains have gradually lost sulfonamide resistance over the years so that at the present time, group B strains, which cause the majority of the cases in the United States, are usually sulfa sensitive. Group C strains are causing about one-third of the cases in civilians while group Y cases are a rarity.[11]

When the military inaugurated the vaccination program with group C vaccine there was some concern that although the immunization program could effectively reduce the incidence of group C meningococcal disease, meningococcal infections might simply be shifted to a group for which there was no immunization. Type specific polysaccharide vaccines are available and are effective immunogens for serogroups A and C meningococci but a similar vaccine has not been produced for group B meningococci since the B polysaccharides have not proven to be immunogenic in man.[12,13] Group C meningococcal vaccine has been used by the Army for new recruits in field trials since 1968, but only became mandatory for new recruits in both Army and Navy since 1971. Meningococcal disease due to group C meningococci in both services has now been reduced to almost nil. It has been speculated that if there should be a rise in the incidence of meningococcal disease due to other groups, group B might be the most likely candidate. In fact, however, this has not happened. Instead, in at least one Naval Center[9] and one Army Training Center[8] there has been an increase in meningococcal disease due to group Y.

The rise in incidence of group Y meningococcal disease is unexpected. Previous studies have shown that over 90% of incoming recruits already have humoral antibodies against group Y meningococci either due to previous exposure to group Y or possibly cross-immunity to other groups of meningococci.[14] Furthermore, although group Y in various studies done in the past 10 years has been a frequent finding in carriers, the incidence of group Y disease has either been absent or very low.[2-4] Whether the rise in incidence of group Y disease in the two military recruit stations mentioned has anything to do with the routine vaccination with group C vaccine is unknown. Vaccination with group C polysaccharide vaccine does not produce antibodies to group Y.[15] This may be explained by studies showing that cross protective antigens, at least in group Y, are protein in nature whereas the vaccine for group C contains only the polysaccharide antigens.[16] Although Goldschneider, et al. have shown a correlation between the presence or absence of group specific polysaccharide antibodies in man and the resistance or susceptibility to meningococcal disease caused by specific groups, there is no reason to believe that these are the only factors involved in meningococcal immunity.[14] Other antibodies, phagocytic cells, and local factors in the nasopharynx undoubtedly also contribute. Another aspect of susceptibility to meningococcal disease relates to the intrinsic virulence of the organism itself. The virulence factor appears to be related to a lipopolysaccharide fraction of the cell wall of the meningococcus. Thus far, however, studies of the chemical composition of the lipopolysaccharides of serogroups notably more virulent (A and B) and those notably less virulent (X and Y) have failed to show significant distinguishing features.[17] The history of meningococcal disease has been notable for a shifting of the groups responsible for the disease production from time to time due to factors which have not been defined. This phenomenon could be operative in the present disease production by Group Y strains. Group C immunization of military recruits may have nothing to do with it. Our patient had not been in the military.

It is apparent from the course of our patient and others described in the literature that Group Y strains are not as benign as formerly believed. They are capable of producing the same spectrum of clinical disease as has been noted with Groups A, B and C.[8,9,11] All of the factors responsible for our patient's demise must remain speculative at this time because of the brevity of our observations and because we were denied an autopsy. It seems likely that the patient had a meningoencephalitis with respiratory arrest as has been described in other cases of meningococcal disease.[18] He may well have had a myocarditis such as described in 78% of fatal meningococcal infections in a study of the pathology of 200 cases.[19] The coagulation abnormalities noted suggest the possibility that the patient was also experiencing some degree of intravascular coagulation.[20]

References

1. Slaterus KW: Serological typing of meningococci by means of micro-precipitation. Antonie van Leeuvenhoek, J Microbiol Serol 27:304, 1961.
2. Fraser PK, Bailey GK and Abbott JD: The meningococcal carrier-rate. Lancet 1:1235, 1973.
3. Artenstein MS, Schneider H and Tingley MD: Meningococcal Infections (Prevalence of serogroups causing disease in US Army Personnel in 1964-70). Bull Wld Hlth Org 45:275, 1971.
4. Altmann G, Bogokowsky B and Egoz N. A study of meningococci isolated from patients and carriers in Israel during 1966-71. Israel J Med Sci 8:1932, 1972.
5. Abbott JD and Graves JFR: Serotype and sulphonamide sensitivity of meningococci isolated from 1966 to 1971. J Clin Path 25:528, 1972.
6. Evans JR, Artenstein MS and Hunter DH: Prevalence of Meningococcal Serogroups and Description of Three New Groups. Amer J Epidemiol 87:643, 1968.
7. Hollis DG, Wiggins GL and Schubert JH: Serological studies of ungroupable neisseria meningitidis. J Bacteriol 95:1, 1968.
8. Smilack JD: Group-Y meningococcal disease. Ann Intern Med 81:740, 1974.
9. Risko JA and Hodges GR: Neisseria meningitidis serogroup Y: incidence and description of clinical illness. Amer J Med Sci 267:345, 1974.
10. Artenstein MS, Winter PE, Gold R et al.: Immunoprophylaxis of meningococcal infection. Milit Med 139:91, 1974.
11. Yee NM, Katz M and Neu HC: Meningitis, pneumonitis and arthritis caused by Neisseria meningitidis Group Y. JAMA 232:1354, 1975.
12. Artenstein MS, Winter PE, Gold R, Smith CD: Immunoprophylaxis of meningococcal infection. Milit Med 139:91, 1974.
13. Meningococcal Polysaccharide Vaccines. Morbidity and Mortality. Center for Disease Control 24:381, 1975.
14. Goldschneider I, Gotschlich E and Artenstein MS: Human immunity to meningococcus. 1. The role of humoral antibodies. J Exp Med 129:1307, 1969.
15. Gotschlich EC, Goldschneider I, Artenstein MS: Human immunity to meningococcus V. The effect of immunization with meningococcal Group C polysaccharide on the carrier state. J Exp Med 129:1385, 1969.
16. Jennings HJ, Martin A, Kenny CP and Diena BB: Cross-protective antigens of Neisseria meningitidis obtained from Slaterus Group Y. Infect and Immun 5:547, 1972.
17. Jennings HJ, Hawes GB and Adams GA: The chemical composition and serological reactions of lipopolysaccharides from serogroups A. B. X and Y Neisseria meningitidis. Canad J Biochem 51:1347, 1973.
18. Wolf RE and Birbara CA: Meningococcal infections at an Army Training Center. Am J Med 44.243, 1968.
19. Hardman JM: Fatal meningococcal infections: the changing pathologic picture in the '60s. Milit Med 133:951, 1968.
20. McGhee WG, Rapaport SI and Hjort PF: Intravascular coagulation in fulminant meningococcemia. Ann Intern Med 67:250, 1967.

MSMA Annual Meeting

"Doctor's Office Call"

What ever happened to the doctor who "just practiced medicine?" Controlling your practice day and practice week—a part of Session R, May 20th at Doctor's Office Call.

Minnesota Urology Society

Spring Seminar and annual meeting, May 7, 9:00 a.m., L'Hotel Sofitel. Contact: S. J. Antolak, Jr., M.D., 228 Lowry Medical Arts Building, St. Paul, 55101.

Improvements of Silica Gel Fraction for Hypothermic Pulsatile Perfusion

New Trends in Cadaver Kidney Preservation

LUIS H. TOLEDO-PEREYRA, M.D., Ph.D.;* RICHARD M. CONDIE, Ph.D.*
RICHARD L. SIMMONS, M.D.;* and JOHN S. NAJARIAN, M.D.*

Silica gel fraction is a new plasma perfusate for hypothermic kidney perfusion. This perfusate can be stored at room temperature for long periods of time. During its preparation, fibrinogen, plasminogen and a significant amount of lipoproteins are eliminated. The HLA antigens are also removed. These characteristics make the perfusate preferable over cryoprecipitated plasma. A clinical comparison between the two perfusates indicate a better long-term function of silica gel perfused kidneys. Improvements in the preparation of silica gel fraction by simplifying its manufacture and increasing the protein concentration offer a better short-term kidney function.

PRIOR TO THE introduction of silica gel fraction of plasma (SGF) for clinical kidney preservation,[1] organ perfusates included albumin,[2] plasma protein fractions (PPF),[3] and cryoprecipitated plasma (CPP).[4] The latter had been our perfusate of choice for hypothermic pulsatile perfusion for organ preservation. However, we reasoned that since the advantages of CPP stemmed from the partial removal by cryoprecipitation of aggregatable proteins, particularly lipoproteins, that a plasma preparation in which these proteins were completely removed might prove to be more efficacious.

In 1973, we introduced a new method to prepare plasma for organ preservation.[1] It consisted of treating plasma with silica gel, a silica dioxide that contains siloxan (Si_2O) and silanol ($SiOH$) groups on its surface. The result was a fibrinogen-free, low cholesterol and low lipoprotein perfusate.[5,6] In an experimental trial on canine kidneys perfused up to 120 hours this silica gel fraction (SGF) of plasma proved to be a better perfusate than the best plasma perfusate available.[6] In a clinical double blind, randomized study, no difference could be found between the immediate function of kidneys perfused with either SGF or cryoprecipitated plasma.[1,7] However, long-term kidney function was better in the SGF group of kidneys (Figure 1). Because of the

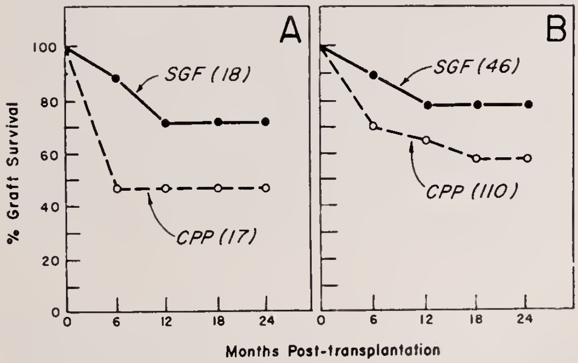

Fig. 1—Actuarial functional survival curves of perfused cadaver kidney transplants. (A) Double blind, randomized clinical comparison between SGF and CPP perfused kidneys. (B) Comparison between the total group of perfused kidneys with SGF and those perfused with CPP (period 1971-1973). Kidneys perfused with SGF had again a better long-term function after transplantation than those perfused with CPP. In parenthesis: number of perfused kidneys in each group.

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practical advantages of SGF (easy preparation and long-term storage at room temperature), as well as better long-term results, we adopted its use for routine clinical preservation.

In this report we analyze the simplified techniques of preparing SGF that avoid contamination, improve the qualities of long-term storage at room temperature, and account for a better posttransplant function. The technique completely removes plasminogen from SGF, and higher concentration of proteins remain, which may account for better preservation results.

Figure 2 shows the modifications in the development of SGF. Briefly, the differences reside in the treatment of plasma (obtained from blood, cryoprecipitated plasma or frozen plasma) with variable amounts of silica gel, the use of saline to wet the silica gel, and the number of silica gel treatments given. We observed an indirect relationship between the amount of silica gel used and the concentration of lipids, proteins, and coagulation factors in the perfusate.

Experimental Results

We compared dry SGF (Figure 2B) and wet SGF (Figure 2C) in a 30 minute warm ischemia, 24-hour hypothermic pulsatile model. Dog kidneys were subjected to 30 minutes of warm ischemia (37°C) and then excised and flushed with Ringer's lactate (4°C), which contained heparin (10,000 U/L) and procaine (0.1 g/L), until the venous effluent was clear. Thereafter they were placed in the Mox-100 machine[1,7] which was primed with 700 ml of SGF. The kidneys were perfused (7°C, pH 7.4, pO_2 200 mm Hg, pulse 60 min., systolic pressure 60 mm Hg) for 24 hours and then autotransplanted into nephrectomized recipients. The dogs' serum creatinine levels were recorded daily until death or killing at 20 days. Postmortem examination was performed in all dogs.

Six of eight (75%) dogs transplanted with kidneys perfused with dry SGF treated once with 20 g/L of silica gel (total protein 45 mg/100 ml) (Figure 2B) survived more than two weeks after grafting. Three dogs had high serum creatinine values immediately after transplanation, one of them decreased to upper normal values on day six, but the other two did not respond to any therapy. Five of eight (62.5%) dogs transplanted with kidneys perfused with wet SGF treated once with 30 g/L of silica gel (total protein 40 mg/100 ml) (Figure 2C) survived for long periods of time (>20 days). Four of the eight dogs had high serum creatinine values immediately after grafting; these values persisted in two dogs until death (at 10 and 11 days) and the other two returned to normal levels within the first week. Three of seven (42%) dogs transplanted with kidneys perfused with SGF treated twice with 20 g/L of silica gel (total protein 35 mg/100 ml) survived long periods of time after transplantation. The remaining four dogs 58%) developed acute tubular necrosis (ATN) and did not survive for more than 10 days after transplantation.

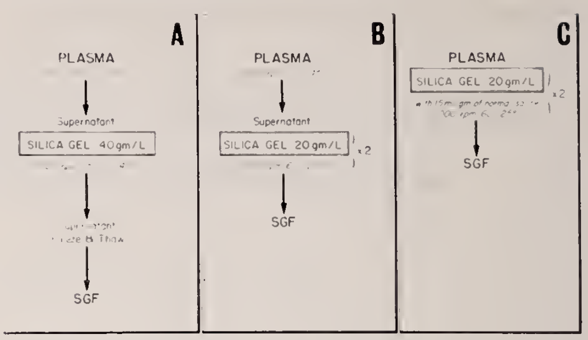


Fig. 2—Evolution of silica gel fraction (SFG) preparation. Methods B and C are experimentally evaluated. Method A has been previously assessed.[5]

The data indicate that kidneys perfused with SGF obtained after plasma treatment with high concentrations of silica gel (40 g/L) were not adequately protected from ischemia and perfusion injury as those kidneys perfused with SGF obtained from plasma treated with low concentrations of silica gel (20 g/L). These preliminary results only suggest the possibility of an indirect relationship between the amount of silica gel used to treat the plasma and its efficiency for renal preservation. Further studies are planned to assess the effect of perfusate protein concentration on kidney preservation.

Clinical Experience

We studied the effect of different preparations of SGF treated with variable concentrations of silica gel on clinical kidney preservation. The average perfusion time for all groups of kidneys was 21 hours. There was no period of warm ischemia. All kidneys were preserved under hypothermic pulsatile perfusion.[1,7] Group 1—Sixteen kidneys were perfused with SGF obtained from plasma treated two times with dry silica gel 20 g/L (total perfusate protein 35 mg/100 ml). The incidence of ATN was 50%, with a long-term function of 75% (last evaluation, 12 months posttransplant). Group II—Thirteen kidneys were perfused with SGF obtained from plasma treated once with wet silica gel 25 g/L (total protein 45 mg/100 ml). The incidence of ATN was 30%, with a long-term function of 93% (last evaluation, eight months). Group III—Ten kidneys were perfused with SGF obtained from plasma treated once with wet silica gel 30 g/L at high speed centrifugation (5000 x G) (total protein 40 mg/100 ml). The incidence of ATN was 50%, with a long-term kidney function of 80% (last evaluation, six months).

These clinical results also indicate a better protection during perfusion in kidneys perfused with SGF treated with low concentrations of silica gel. The preparation of silica gel fraction was improved by increasing the concentration of total proteins and simplifying its manufacture. Long-term storage (>12 months) was satisfactory when proper sterilization techniques were used. We observed no contamination in 100 Liters of SGF made in our laboratories for use in clinical preservation. This perfusate was free of pyrogen and particle flocculation and showed no bacterial growth. Higher concentrations of proteins in SGF can contribute to a better short and long-term kidney function after perfusion and transplantation.

Discussion

The reasons for improved long-term clinical results of kidneys perfused with SGF are difficult to pin-point. They could stem from the stabilization of plasma treated with silica gel by removal of aggregated and denatured proteins which could, immediately or later, precipitate and block the capillaries of the perfused kidneys. The removal of the high density lipoproteins and the associated HL-A antigens together with the proteolytic enzyme plasminogen could also explain the better long-term function of these kidneys. It is known that a potent activator of plasminogen, urokinase, is liberated from the urinary tract epithelium and it could cause proteolysis of the capillary endothelium of the perfused kidney. The presence of immunogenic HL-A antigens in plasma[8] and in commercial plasma protein derivatives (PPF) prepared by the Cohn cold ethanol fractionation technique has been associated with poor cadaver graft survival. More specifically, the increased use of PPF transfusions in hemodialysis and transplant programs and the perfusion of cadaver kidneys with cryoprecipitated plasma[9] have been implicated in the increased incidence of accelerated allograft rejections[8]. The removal by silica gel of plasma lipoproteins including the high density lipoproteins with which the HL-A antigens in plasma are associated[10] could account for the better long-term kidney function results obtained with SGF plasma. Thus, we should consider the use of SGF treated plasma not only as a perfusate but also in place of whole plasma or PPF when transfusion with blood derivatives is indicated in dialysis patients or transplant recipients.

The treatment of plasma with silica gel yields a stable preparation that can be stored at room temperature for over two years without losing its properties for support of organ perfusion. It is an improved perfusate for kidney hypothermic pulsatile perfusion. SGF as an organ perfusate is easy to prepare, can be stored at room temperatures for long periods of time, and does not contain cellular debris, bacteria and HLA antigens. It gave improved long-term results when compared with the best available perfusate (CPP) for kidney perfusion.

References

1. Toledo-Pereyra LH, Condie RM, Moberg AW, Simmons RL and Najarian JS: Advantages of silica gel absorbed plasma perfusate for clinical renal preservation. Transpl Proc V11:573, 1975.
2. Claes G, Aurell M, Blohme I and Pettersson S: Experimental and clinical results of continuous hypothermic albumin perfusion. Proc Eur Dial and Transpl Assoc 9:484, 1972.
3. Mendez-Picon G, Belle C, Pierce JC, Thomas F, Murai M, Wolf J and Lee HM: Use of plasma protein fraction in preservation of cadaveric kidneys. Surgery 79:364, 1976.
4. Belzer FO, Ashby BS, Huang JS, Dunphy JE: Etiology of rising perfusion pressure in isolated organ pressure. Ann Surg 168:382, 1968.
5. Toledo-Pereyra LH, Condie RM, Malmberg R, Simmons RL and Najarian JS: A fibrinogen-free plasma perfusate for preservation of kidneys for one hundred and twenty hours. SG&O 138:901, 1974.
6. Toledo-Pereyra LH Condie RM, Malmberg R, Simmons RL and Najarian JS: Long-term kidney preservation with a new plasma perfusate. Dialysis Transpl Forum 111:88, 1973.
7. Toledo-Pereyra LH, Condie RM, Mozes MF, Moberg AW, Simmons RL, and Najarian JS: Clinical kidney preservation results with a silica gel fraction of plasma. Proc Clin Dialysis Transpl Forum 1V:193, 1974.

8-10. Will be found on page 283.

Book Reviews

GENERAL UROLOGY by Donald R. Smith, M.D. Lane Medical Publications. Price $10.50. Eighth Edition.

Dr. Donald Smith is Professor and Chairman of the Division of Urology, University of California School of Medicine in San Francisco. General Urology, for many years a urologic textbook for medical students, also may serve as an excellent reference for general practitioners, surgical and medical residents, nurses, and urologic assistants.

The enlarged eighth edition—48 pages longer—includes three new chapters and one completely revised chapter. While Dr. Smith wrote 24 of the 34 chapters in the book, other experts wrote the ten chapters on specialized subject fields.

General Urology provides a compendium of urologic disorders with emphasis on anatomy, embryology, pathophysiology, diagnostic methods, and differential diagnosis. Therapy is not discussed in great detail, but basic treatment is adequately presented. Important references are listed at the end of each chapter. The book is well-illustrated, and the text is printed in a double-width column for easier reading.

One of the best chapters in General Urology is Radioisotopic Kidney Studies by M. R. Powell, M.D., and J. M. Weiss, M.D. The authors clearly and succinctly explain the role of radiopharmaceuticals, gamma radiation detectors, and isotopic techniques in clinical application. In the new edition the authors have added a list of new radiopharmaceuticals incorporating the radionuclide ^{99m} Tc. Whole body bone scans for early detection of osseus metastases, and the ^{67}Ga scan for detection of a wide variety of tumors and also abscesses are discussed.

In the chapter on Nonspecific Infections of the Urinary Tract, the section on bacteremic shock has been improved considerably. The table on antibiotic and chemotherapeutic agents is updated by the addition of new antibacterials, and the usual daily doses of these antibacterial agents are accurately listed. The editor has included four chapters which traditionally are not contained in standard urologic textbooks: viz., Urologic Laboratory Examination, Instrumental Examination of the Urinary Tract, Skin Diseases of the External Genitalia, and Psychosomatic Urinary Frequency and Retention.

I have a few minor criticisms of this book. For example, in the section on benign prostatic hyperplasia, there is no mention of postobstructive diuresis or the T.U.R. syndrome (dilutional hyponatremia) which are formidable and not infrequent problems. In the chapter on Injuries to the Genitourinary Tract, the author does not mention the use of renal arteriography to determine the extent of parenchymal damage or injury to the renal artery. In the chapter on the Neurogenic Bladder, the use of the CO_2 cystometer is not mentioned. The CO_2 cystometer is certainly more expeditious if not more accurate than the water manometer.

Three new chapters have been added to the 8th edition: viz., Ultrasonic Examination of the Urinary Tract, Immunology of Genitourinary Tumors, and Chronic Renal Failure, Dialysis and Renal Transplantation. These chapters are excellent and along with the revised chapter on Abnormalities of Sexual Differentiation would make it worthwhile for practicing urologists and urologic residents to have the eighth edition of General Urology in their libraries as a ready reference.

Clyde E. Blackard, M.D.
St. Louis Park Medical Center

DERMATOLOGY, by Wm. D. Stewart, Julius L. Danto, and Stuart Maddin, 537 pp, $22.50, St. Louis. C. V. Mosby Company.

The authors in this text have attempted to present to the reader a current review of clinical dermatology. This book is considered the third edition of Synopsis of Dermatology. In the present edition, extensive, revisions have been made in the text as well as changes in the format. The text is supplemented with numerous black and white as well as 57 color photographs. The quality of which is good.

The contents begin with a brief section on the structure and function of the skin. This is followed by a clinical section including examination of the patient, therapeutics, and techniques. A section on regional diagnosis is quite well done and would be of help to the clinician. The remainder of the text involves descriptions of dermatologic diseases. Of importance is the fact that discussions of diseases include differential diagnosis and treatment. The authors have expanded the references, and many are current.

The chapter on cutaneous immunological diseases is nicely presented and includes discussions of contact dermatitis, urticaria, and atopic dermatitis. The authors have attempted to review for the reader some of the newer advances in basic immunology, as it pertains to these entities. With the increased emphasis on drug reactions it is nice to see a fairly complete chapter on this subject for a book of this size. The discussion of malignant tumors has been expanded over prior editions and includes helpful illustrations. Due to its increased incidence, a chapter on perioral papular dermatitis is included.

In all the authors have attempted to present a fairly complete coverage of dermatology. However, many of the subjects are only briefly covered. This is to be expected within the confines of this size volume. The book is well written, nicely illustrated and current. It can be recommended.

Willard Peterson, M.D.
Minneapolis, Minnesota

Interviews

An Interview with Richard J. Frey, M.D.

Chairman, Council of the Minnesota State Medical Association

Interviewer: *You have been Chairman of the Council for two years. What is the most significant thing that has occurred in the State Association in those years?*

Dr. Richard Frey:

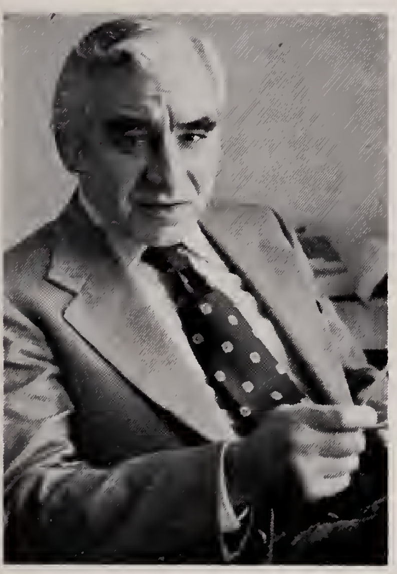
The most significant thing is the commitment from officers and members to restructure our Organization. The members have paid more dues. We have expanded our staff. We *have* become more involved. We are more effective, and we have extended our efforts to areas that five to 10 years ago did not even exist.

I mentioned to the House of Delegates that this extended commitment increases each year. The State Association has addressed itself to changing times.

Interviewer: *Could you tell me in specific terms how many members have been added to the State Association staff in this reorganization effort?*

Dr. Frey:

I can't give you any precise number, but, we have added key people to staff new departments within the State Organization. Even more importantly, we have delegated to existing people more specific responsibilities, so that they can perform more effectively in those areas in which they are responsible.



Interviewer: *Could you list a few specific responsibilities?*

Dr. Frey:

The one that has the greatest visibility is the Division of Socio-Economic Affairs. I want to stress, however, that the staff of the State Medical Association was not dormant prior to the reorganization. They were an effective staff, but the workload had expanded so much that leaders of the Association felt strongly that we had to reorganize to carry out our members socio-economic responsibilities. Some of these responsibilities include continuing medical education, communications with the public and socio-economic affairs. This did necessitate not only the addition of more persons to specific departments, but also instituted a more clearly defined delegation process within the existing structure.

Interviewer: *As you know, the Government has attacked the Relative Value Scale as an illegal price-fixing mechanism. Could you comment on this issue?*

Dr. Frey:

The Minnesota State Medical Association is under informal investigation by the Federal Trades Commission as it relates to the relative value index. This investigation obviously stems from concern by the Federal Trade Commission that the Minnesota Relative Value Index is a fee fixing instrument, and as such is in violation of the antitrust laws.

Let me say historically that the Relative Value Index was never created or adopted to be a fee schedule. It established a relativity of value measured in terms of effort and skill for medical and surgical services. It was adopted in response to demand by third-party payers in both private and public sectors. I sincerely believe that it has served the public interest as it brought to the intermediary a guide line for actuarial consideration. I repeat that this has never been proposed as a fee schedule, minimum, or maximum, by the Minnesota State Medical Association, or to my knowledge by one of its component societies.

The council and many of the membership feel that this action constitutes an unjustified attack by the Federal Trade Commission. We should recognize that medicine does not stand alone as a target of the Federal Trade Commission. Many of the institutions of our society are being similarly challenged for alleged unfair practices, restrictive covenants, and so on. There is little doubt that we will continue to see further attacks on organized medicine by the Federal Trade Commission in areas of traditional medical ethics, medical education at the undergraduate and postgraduate level, hospital privileges, and the very licensure procedure itself. We will be accused of being too restrictive in these and many more areas.

There can be little doubt that there is a deliberate, poorly conceived but well planned bureaucratic attempt to utterly destroy the very organization of medicine. It is not only difficult for us to see how this action can possibly be construed to be in the public interest, but even more difficult for us to foresee anything short of chaos as one arm of government demands cost consciousness and analysis and the other dictates the destruction of our guidelines. This is bureaucratic schizophrenia. However, the Council in view of the limitation of our resources has unanimously voted to instruct our legal counsel to seek a consent order with the Federal Trade Commission, by which Minnesota State Medical Association will completely abandon the sponsorship and use of the Minnesota Relative Value Index. This is in no way an admission of misuse of the Relative Value Index, but it is a mechanism of removing us from the time and expense of any further investigation of this issue.

In compliance with the Federal Trade Commission directive a Power of Attorney from each of our thirty-four component societies has been obtained by the Minnesota State Medical Associa-

tion so as to make our consent order binding on all components of our association. This order has now been signed and is currently under review by the Federal Trade Commission. I hope we can lay *this* matter to rest in the near future.

As you know, the National Organization of Anesthesiologists are pursuing the defense of the Relative Value Index in the Courts, although they have not yet reached the Courts. They have already spent $165,000, and they have programmed for a $500,000 expenditure and will very probably need more before they complete their suit. As you can see, we as a state or county organization can not commit our membership to such costs on an issue such as this.

Interviewer: *Let's take a specific national issue, namely, Public Law 93-641 the National Health Planning and Resources Development Act of 1974. How has the reorganized Assocation decided to cope with that Act?*

Dr. Frey:

As you know, the law mandated the division of the country into health service areas. Minnesota has seven health service areas. These are in the stage of very, very early development and Health Service Agencies are complicated because they involve a great deal of consumer input. There are various levels of sophistication of people in these agencies, and through the structure of the Division of Socio-Economic Affairs, and the sub-division of health planning, we are trying to relate specifically to them. I think this proves already the effectiveness of dividing responsibility and clearly delineating the authority within our structure to operate outside of the State Association itself in an advisory capacity for the various health service areas. I think we have an opportunity here to have a real input into the development, planning, structuring, and the operation of these areas in the future.

Interviewer: *Some physicians have said that Public Law 93-641 is the frame work on which a national health service will be hung. Do you agree with that?*

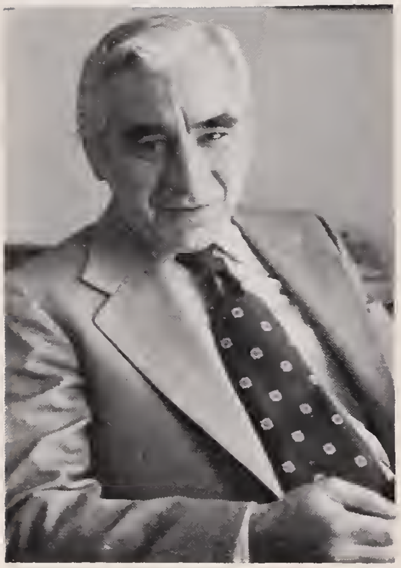
Dr. Frey:

I do agree. It constitutes a regionalization that will serve as an effective framework from which to launch a total national health service type of program. In fact, I think the law is so expansive in its commitments and area of authority that universal national health service could be launched without any further legislation, if the full provision of this law were to be realized.

Interviewer: *What do you foresee as far as the National Health Care Legislation of the Carter-Mondale Administration?*

Dr. Frey:

Well, that is strictly speculation. However, philosophically, the Carter-Mondale Administration is committed to sponsoring or at least strongly supporting a national health insurance program. I think, however, and this would be a very personal judgment, that there will be real concern in the present Congress as well as the Executive Branch over the cost impact on our economy of a national health insurance program like the Kennedy-Corman proposal. I do not think they are going to push a Kennedy-Corman type bill.



Interviewer: *Do you feel then that the basic mood of the country is conservative? To put it in another langauge: Do you think that Carter will follow his campaign rhetoric—that he will not introduce national health insurance until we can pay for it?*

Dr. Frey:

I do not think we are living in conservative times. But it is a matter of relativity. I suspect that Carter and his aides will approach the bill slowly with this relativity in mind. They will stress accountability for cost commitment of introducing a national program. I do not think he will introduce a sweeping national health insurance program, without having made provisions either to tightly control costs or to provide for payment of the program. I am sure he would be willing to tolerate some increase in debtedness. I suspect that there will be more caution now that he is elected president, and has a legislative body of the same party, than I had anticipated in the pre-election times.

Interviewer: *Do you think he might choose private carriers rather than HEW as the vehicle for paying?*

Dr. Frey:

I don't know that. I suspect that as he tempers his approach to this, as I believe he will. I would think it more likely that he may look to more involvement of the private sector than we have anticipated in the past.

Interviewer: *On the local level, the Minnesota Legislature just opened its bi-annual session. What issues does the Association intend to concentrate on in their dealings with the Legislature?*

Dr. Frey:

Well, our dealings for this coming session will not materially differ from what they were during the last session, since relatively little was done in the last session, and there is a tremendous amount of carry-over. I refer specifically to professional liability problems, and we do have a package of legislative proposals that is similar, only slightly modified to what we had at the previous session.

I do not think time should permit dissection of the various legislative proposals with respect to professional liability since we have discussed these, and I am sure that most of our membership is fairly familiar with them. There are other areas, of course, possibly of lesser magnitude, with which we will also deal.

I would like to say that we feel as strongly as ever about the need for continued effort in the professional liability area, but we do not look for a total solution to our problem through changes in current legislation. We think this legislature might contribute maybe 20% to the overall solutions of our problems, but our internal risk management programs and physician education, public education, etc. will do far more to alleviate professional liability problems will specific statutary changes.

Interviewer: *I read recently that the St. Paul Companies have reduced their malpractice rates in three states, including Minnesota. Do you think there is a glimmer of hope for reduced malpractice rates?*

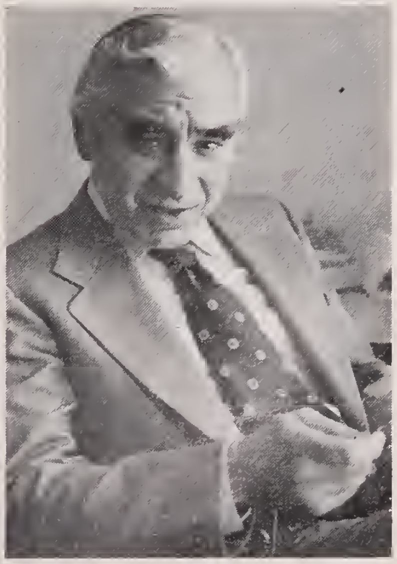
Dr. Frey:

There is a glimmer of hope, but I think there is a potential for misinterpretation of this reduction. As you recall, on a national basis, we have seven categories of classification for physicians, and also on a national basis, and followed by the St. Paul Companies, we have had reclassification of physicians within these categories, because of specific procedures which they do.

Now because of this reclassification the St. Paul Companies is able to extract more premium dollars from some physicians and therefore reduce rates of others. You may be placed into Class 3 and actually reduce your rates as a Class 3, but it is an increase if you were previously a Class 1 physician. This has been a point of some concern with some of our physicians in the State.

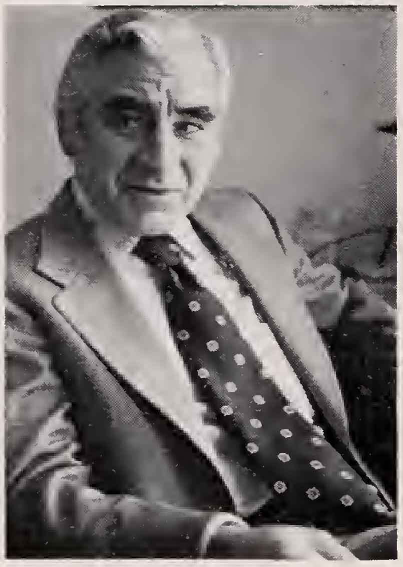
The overall impact of this reduction is really not clearly known, because we cannot match it against the increased premium dollars that have been extracted from our membership through reclassification techniques.

However, I think the good part is that it is true that the expenditures for claims to this point in time are less than projected. So



we are making some progress in that area. I think the bad part of this type of publication of premium reduction is that it may mislead physicians and legislators alike into thinking that the problem is solved. I do believe we are only scratching the surface of the problem.

Interviewer: *One of the hottest issues both nationally and locally is run-away inflation in the health care sector. Do you think the State Association has any role to play in trying to get physicians to help reduce this inflationary spiral?*



Dr. Frey:

Yes, I do think we have a role. There are many inflationary factors over which we have control. This includes the health care field. Regardless of what physicians do, we will have some continued inflationary impact of health care costs as we have had in the past. My real concern is that with expanding technology and the ability to explore and study so many diseases in such greater detail, cost expenditure per illness can run away. This is not all an inflationary increase. This represents an increase in intensity of investigation and intensity of service that the individual patient receives. In this area, I feel, the physician is substantially responsible since he serves as the purchaser of care for his patient.

Interviewer: *When the Minnesota Hospital Association announced its rate increases for 1976 of 17%, a spokesman for the Association said that the increase was not true inflation because patients were getting a different product. Do you agree with that assessment?*

Dr. Frey:

That's partially true. There is an increase in intensity and nature of services in the hospital which accounts for some of the increased cost. On the other hand, there is also that inflationary factor. The inflation itself, I believe, would account for far less than 50% of the increase in hospital costs that we have seen. I do believe that the increased technology that is available and increased utilization of the technology accounts for the major portion of increased hospital costs. Certainly, a portion of this latter element is inappropriate at this point. Is there cost benefit justification measured in terms of outcome?

Interviewer: *Do you think it is possible to shift hospital services outside of the hospital to offices and even homes? Do you think this is a feasible thing to do?*

Dr. Frey:

Well, I think it is not only feasible, but I think it is absolutely essential that we shift some of our care. Much as we try with peer review mechanisms and the like, I feel there is still a great deal of institutionalization of our care that could well be handled otherwise.

I speak of such things as outpatient surgical care and home care units that might alleviate some of the long term nursing home problems where we spend a tremendous amount of our dollars, particularly in the welfare field.

But more importantly, I think we can change medical patterns of practice so that more and more of the work that is currently being done on an institutional basis can be done on an out-patient basis, including the physician's office.

In other words, we ought to take a hard look at the need for institutionalizing patients. I think herein lies an opportunity to materially reduce the cost of medical care but not in the cost per day within a hospital. Actually, the cost per day will continue to go up. But we can substantially reduce the cost per capita, the cost per illness.

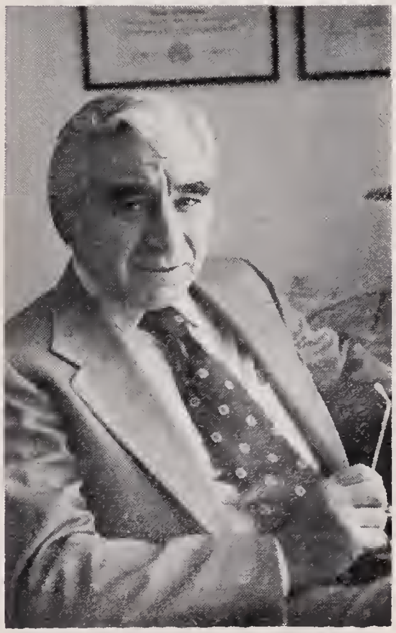
Interviewer: *But this is politically difficult. The hospitals are in financial trouble and are seeking more and more patients. Yet you are saying that more patients should be shifted to the offices, outside the institutions. Don't you think the hospitals are and will be increasingly competing for patients?*

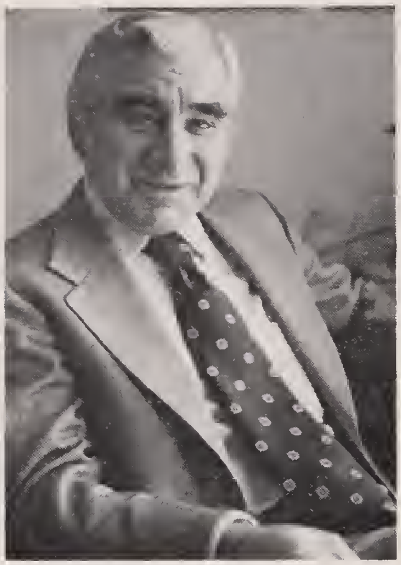
Dr. Frey:

I think our only chance to remain as a free enterprise is to shift the patterns of health care and medical care delivery. I agree with you completely that the hospitals are in a financial squeeze and are approaching bankruptcy, or at least could be led to bankruptcy quickly with any tightening of the federal pursestrings.

However, the hospital's distress only magnifies our inflation problem. It puts us in a incongruous situation if you look at the hospital administrators and the physicians as a total team. Physicians and administrators are committed to a cost containment philosophy and program. Yet administrators must expand the amount of dollars spent within that hospital if they are to survive.

That puts physicians and administrators on a collision course as far as I am concerned, and I think this is just where we are today. I would like to look back and think why we are there. We did not do this. Maybe some of our members did participate. This did not come as an overnight project. The hospitals, in my mind, have assumed a big business type of image, an imagery that now forces them to portray themselves as the citadel of health care and attract everybody they can into the hospitals to support





their very strained financial situation. As such, they can only work adversely towards a cost containment program. They may be able within the confines of a specific community to not increase health care costs if they will steal from another hospital, but that only magnifies the problems in the other hospitals.

So the community as a whole has not found any solution merely because of inter-hospital competition. I liken it sometimes to General Motors who builds Cadillacs, and then markets these Cadillacs to those who will buy. They did not go out into the community and survey you or survey any one else and say this percentage of the people need a Cadillac. They built a Cadillac to serve the needs of General Motors.

I maintain the hospitals have actually developed themselves into empire-type structures, not looking so much at community needs, not really measuring community need and promoting their expansion on this basis, but going willingly, competing with one another, sometimes irresponsibly with respect to the need of the community, and now are harnessed with a super structure that the community cannot rationally support.

So what do we do? I think if we do the job and we do it well, someone must get hurt. If we are going to do a job in cost containment, our present expanding hospital structure with the fantastically expanding technological equipment is going to be compromised.

I think physicians must measure up and be a part of this, not in hurting the institution, but taking a hard look at each and every patient for which they are responsible and asking if this patient really needs this study? Does this alter the outcome of that patient in any way? Should I spend this type of money? If he does this and does a conscientious job of it, there is only one result. There will have to be some retrenchment in our hospital programs. The survival of both institutional and individual freedom is at stake.

Interviewer: *Speaking of hospitals and the private physicians, a recent federal document* pointed out that 92% of hospital costs were covered and only 62% of outpatient costs. Do you think some shift to outpatient coverage would alleviate this high rate of hospitalization?*

Dr. Frey:

Yes I do. Unfortunately, this is still a problem, but it is not as much a problem as it was five years ago. We have made progress in getting greater and greater outpatient coverage for the population, but it is still a factor in steering patients into the institution, when institutionalization for care is not needed other than for insurance benefit eligibility.

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*Council on Wage and Price Stability: The Complex Puzzle of Rising Health Care Costs. December, 1976.

Interviewer: *You think, then, that patients would be perfectly willing to be seen as outpatients if their visits would be paid for, rather than going to the hospital?*

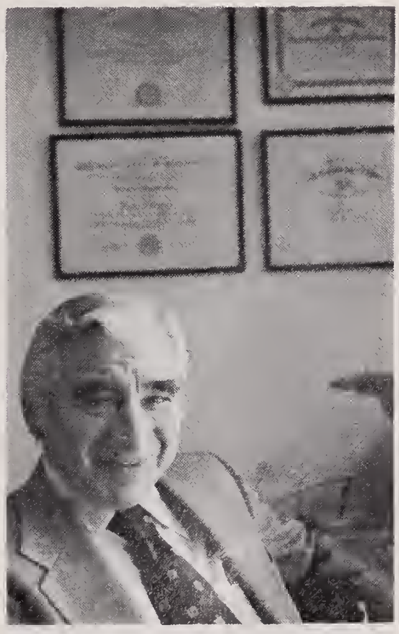
Dr. Frey:

Yes, I think there is an extremely small minority that want to go to the hospital, just to go to the hospital. If there is no dollar advantage, I think we will have no difficulty in educating the public to receive a maximum amount of care as out patients.

Interviewer: *Because of sensitivity of the public to hospital costs, are many people now choosing not to be admitted to hospitals?*

Dr. Frey:

I think there is an awareness and a sensitivity, but the sensitivity stops in large part at the conversational level, because we have the wrong type of coverage. You either have a fixed deductible which you will exceed in the first 45 minutes of hospitalization or dollar one coverage and therefore, all incentives to minimize hospital stay or need for sensitivity to increasing hospital costs are gone; the patient is no longer financially responsible. I do believe that if we can structure some type of a system that preserves or promotes co-insurance type of coverage, we will then have the public really look at hospital costs, really look at what health care they are purchasing. Patients have to participate for the more we go down the road to dollar one coverage in insurance benefits, the more we depart from public support for cost containment in the health care field.



Interviewer: *The Government gives lip service to "preventive medicine," and says this is a mechanism for containing costs. Yet they never specify exactly what preventive medicine is. Don't you think prevention is best promoted through mass public education? After all, how can the individual physician change the public's life style, try as he may?*

Dr. Frey:

I agree. The impact that we will have on long-term illness and episodic illness through preventive measures is going to be primarily changes that fall more in the social and environmental fields than they do in medical practice.

We have made great strides in preventive medicine as you look to the immunization programs and screening programs with respect to specific diseases? Pushing "preventive medicine" is political mischief. It is a facade, a fuzzy facade that sounds good. Most health practitioners in the country today are doing their best to practice "preventive medicine." There are no secrets of preventive

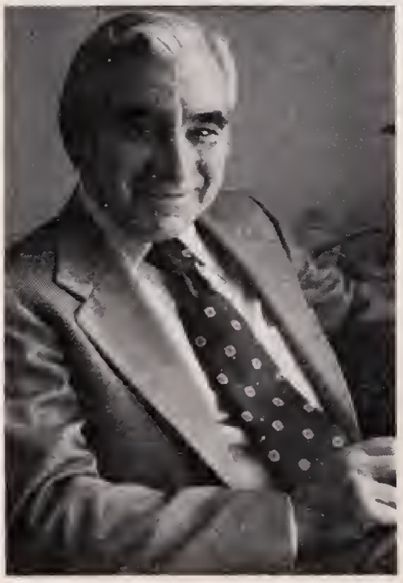
health in a HMO that are not available to the every day practitioner. The real preventive medicine that means something is control of living habits, such as drugs, alcohol, tobacco, violence on the highways, poverty to the point of starvation, rat infestation, and so on down the line. These are areas where appropriate dollars should be spent because that's where the real payoff is.

Interviewer: *How can the medical profession bring these alterations in life style to the public's attention?*

Dr. Frey:

Obviously, we have some influence with society as we see patients on an individual or a family basis. Every physician has his impact in some of these areas I have mentioned. In the greater social arenas, where large dollars are needed to have impact on the environment, I believe the physician can still be a community leader and participate in public education to that point where the public themselves will demand and establish priorities essential to effect these changes.

I think now that in our own organization with our newly developing communications department we should and will assume a greater role in public education so that we can stress what really should be priorities in health care and medical care to the public. This is an opportunity for us to really perform an effective service.



Interviewer: *Will the new Director of Communications for the Association also be communicating with the physicians?*

Dr. Frey:

It is my hope that he will establish an effective channel of communication with all of our member physicians. I like to think of the Communications Division as part of our field service. However we want a commitment of our entire staff and those that are involved in the leadership of the Association to spend more and more time in an outreach type of program. We want to have a good interchange of ideas as they relate to policy, as they relate to the implementation of programs, legislative considerations and the like, with all of our membership. I do expect our Communications Director to play an active role in at least steering this type of effort, not only participating as an individual, but directing many others so that we can greatly improve the communication we have with the membership. We need internal and we need external communications.

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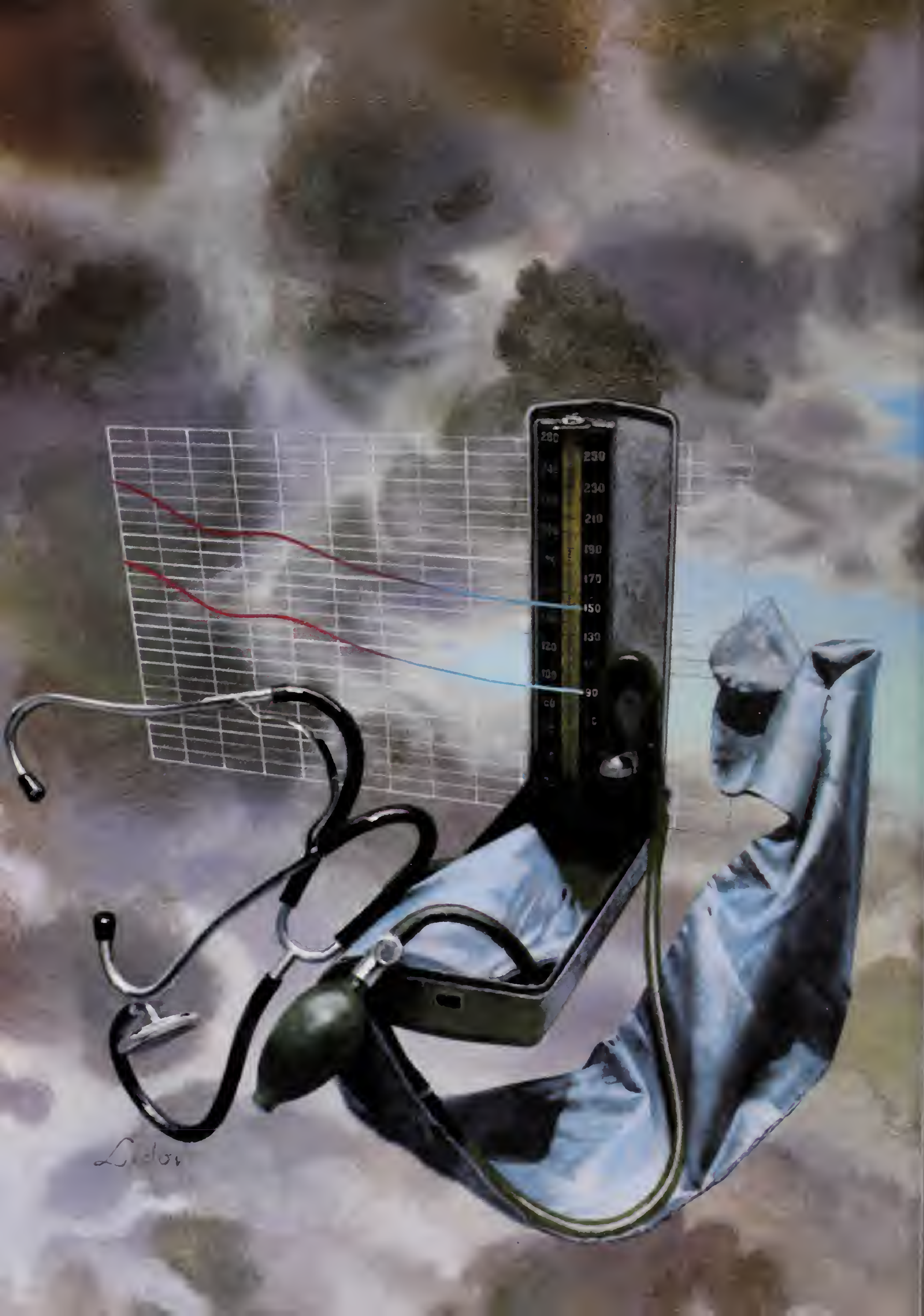
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References:

1 Dornfeld L, Kane R Metolazone in essential hypertension The long-term clinical efficacy of a new diuretic. *Curr Ther Res* **18:** 527-533. 1975

2. Data on file, Medical Department, Pennwalt Prescription Products

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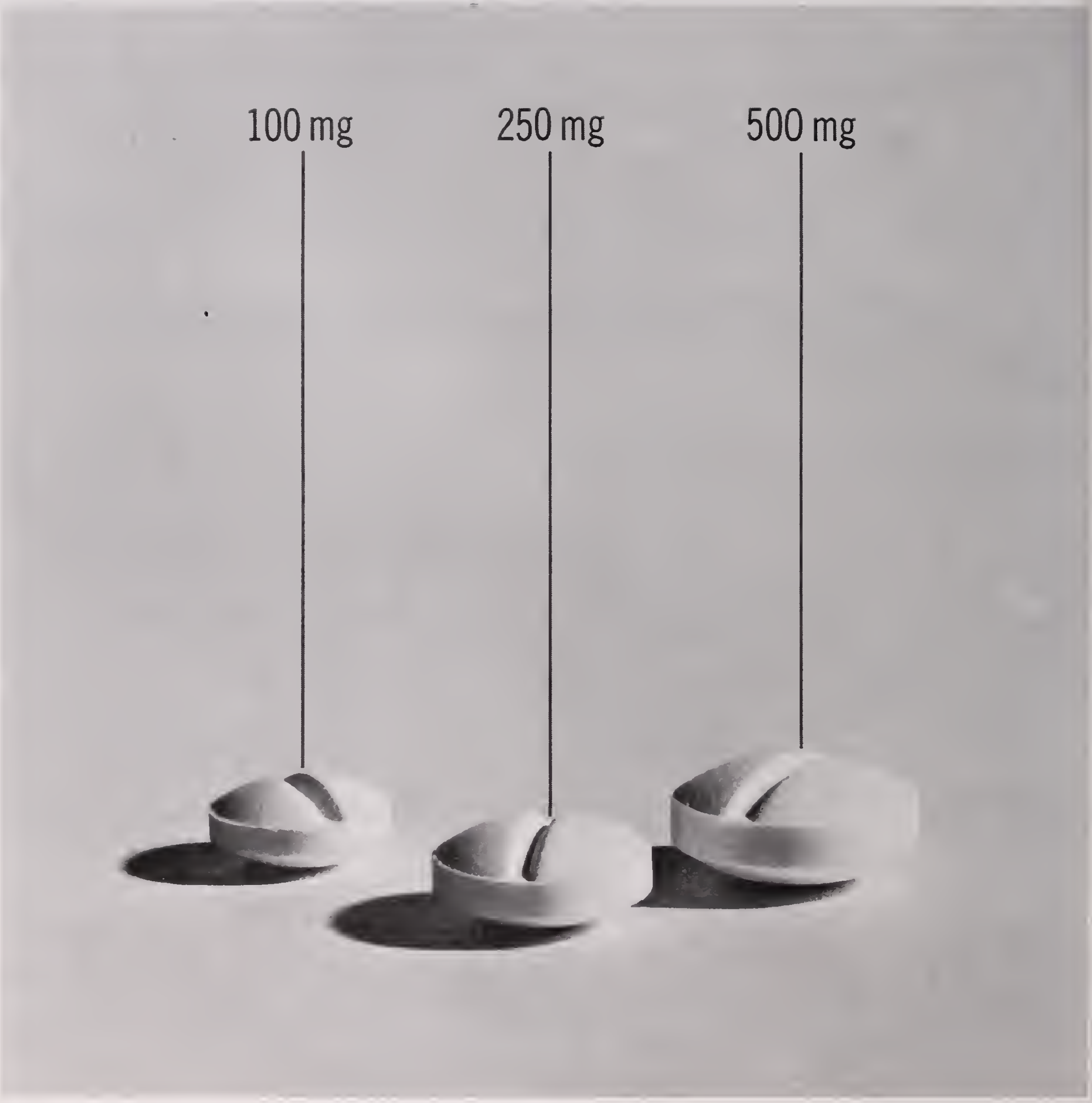
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Editorials

Diabetes Mellitus

In the field of endocrinology and especially diabetes, there are several controversies, but none so important as the issue of control of blood sugar and its relation to vascular disease. There are basically two philosophies involved and whichever philosophy is adopted will govern the method of therapy one uses to control the diabetes. In its simpliest form the two philosophies are as follows: (1) The vascular disease in diabetes is a genetic *concomitant* of the disease and is in no way related to the blood sugar or the therapy of the disease and, (2) The vascular disease is a *complication* of the diabetes and can be prevented or at least slowed in its development by careful and meticulous metabolic control.

If one adopts the philosophy that the vascular disease of diabetes is a concomitant and is in no way altered by control, then it follows that one should use a method of control designed only to prevent ketoacidosis and hypoglycemia and be little concerned with controlling the blood sugar or preventing glycosuria. The simpliest management plan available should be used. Physicians following this philosophy usually tell their insulinopenic patients to simply take their insulin once a day and to maintain their urine tests 2 − 4 +, but acetone free. Diet control is usually nonexistent (a free diet) or is only lightly structured. Hypoglycemia is to be avoided at all costs. This system of management is said to have the advantage of not being "rigid" and therefore it will not create psychologic problems. This philosophy was given support by the studies of Siperstein et al.[1] and by several past clinical studies[2] which failed to show a relationship between control and the prevention of vasculary disease.

More recently, however, new data have become available bearing upon this important issue and it is an important issue. There can be no more important issue when viewed from the vantage point of the diabetic. These new data are too numerous to be discussed here.[3-8] Suffice it to say that almost all of the recent data utilizing new and modern tools have supported the concept that the vascular disease is in some way related to the hyperglycemia and/or the hypo-insulinemia.

In all fairness, it must be said that the data relating vascular disease in diabetes to control is far from conclusive at present. Nevertheless, the data continues to mount and it seems conclusive enough to this investigator to require us to at least re-evaluate our standards and methods of control.

It is an old axiom of medicine to "first of all do no harm." There is now evidence that poor diabetic control is harmful. Certainly in the short run, poor control offers no advantages (more problems with infection, more frequent ketoacidosis, etc.). There is now at least suggestive evidence that less than optimum diabetic control may also be harmful in the long run (vascular complications).

The question then remains, since we have no *conclusive* proof that good diabetic control helps in the long run. does it hurt? It has been long held that "rigid" control of diabetes will so alter

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the life style of the diabetic that psychologic problems will be created. Thus, the need of a looser regime. Recent studies by Simonds[9] on a large group of very highly controlled diabetics show fewer psychologic problems than other groups of diabetics, and very little more than a control population of non-diabetics. Indeed, these people had no severe psychiatric problems and had no problems not expected in any population of children facing a life-threatening chronic disease. In spite of a higher degree of diabetic control with much less glycosuria and hyperglycemia than most diabetics, this population at the University of Missouri had fewer bouts of hypoglycemia than populations of patients controlled by traditional means with more hyperglycemia.

These and other data support the concept that attaining and maintaining a high degree of metabolic control in diabetics, especially in the insulinopenic diabetic is not harmful and may be helpful. If a high degree of control is not harmful, then it is this investigator's opinion that we should at least give the diabetic the benefit of the doubt until all the facts are in. This is also the official position of the American Diabetes Association.[10]

An article by Dr. G. E. Cotton[11] presents a method of management based upon the philosophy that control is important in the prevention of vascular disease in diabetics. He has also presented a method of management which in the opinion of this investigator is practical and flexible. The method of management must be flexible so that the diabetes is made to fit the life style of the patient, not the patient to the diabetic regime. Dr. Cotton advocates a controlled diet and multiple or split dose insulin therapy. Such a regime would superficially seem confining and rigid. In this investigator's experience such is not the case. In my experience, especially with children and adolescents, the more doses of insulin per day, and the more feedings, provided the *more* flexible life style. Almost all of the diabetics I have changed from one to two doses of insulin per day have told me that the second shot increased their flexibility, especially for their evening activities. Meal times are *less* rigid and hypoglycemia *less* common in spite of better diabetic control.

The program Dr. Cotton has outlined is an excellent one. Though I do not agree with every small detail, especially for small children, I do agree with most aspects of the program. In light of recent data relating to the need for a high degree of metabolic control in diabetes, and for the sake of the diabetic patient, until all the facts are in, I strongly commend a careful reading of this article and others[12] of a similar nature, and the implementation of these programs.

Richard A. Guthrie, M.D.*
Wichita, Kansas

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*Professor and Chairman, Department of Pediatrics, Wichita State University Branch, Kansas University School of Medicine.

References

1. Siperstein MD, Unger RH and Madison LL: Studies of muscle capillary basement membranes in normal subjects, diabetic and prediabetic patients. J Clin Invest 47:1973, 1968.
2. Knowles HC Jr et al.: The course of juvenile diabetes treated with unmeasured diet. Diabetes 14:239, 1965.
3. Kilo C, Vogler N and Williamson JR: Muscle capillary basement membrane changes related to aging and diabetes mellitus. Diabetes 21:881:1972.
4. Osterby R: Morphometric studies of the peripheral glomerular basement membrane in early juvenile diabetes. I. Development of initial basement membrane thickening. Diabetologia 8:84, 1972.
5. Lundbeck R: Diabetic angiopathy. Acta Diabetologia Latina 10:187, 1973.
6. Bloodworth JMB Jr. and Engerman RL: Diabetic microangiopathy in the experimentally diabetic dog and its prevention by careful control with insulin. Diabetes 22 (Suppl. 1) 290, 1973.
7. Sheikholislam BM et al.: Carbohydrate metabolism and capillary basement-membrane thickness in children. I. Cross-sectional studies, II. Longitudinal studies. Diabetes 25:650, 1976.
8. Mauer SM et al.: Immunopathology of renal extracellur membrances in kidneys transplanted into patients with diabetes mellitus. Diabetes 25:709, 1976.
9. Simonds JF et al.: Problems in Management of Diabetic Youth. The Diabetes Educator, Fall, 1976. Vol. 2, No. 3:14, 1976.
10. Cahill GF Jr, Etzwiler DD and Freinkel N: Control and diabetes. New Engl J Med 294:1004, 1976.
11. Cotton GE: Diabetes mellitus. A plan for the physician and his patient. Minnesota Med 59:784, 1976.
12. Jackson RL and Guthrie RA: The Child with Diabetes Mellitus Scope Monograph Current Concepts Series, The Upjohn Co., Kalamazoo, Michigan, 1975.

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The report of two cases from the Veterans Administration Hospital* of massive retroperitoneal bleeding manifested by perianal ecchymosis points out the importance of recognizing physical signs, particularly when dealing with an acutely ill patient.

Retroperitoneal bleeding can be insidious in onset. A patient can lose a considerable portion of the blood volume without developing hypovolemic shock if the rate of bleeding is not rapid. It is in these cases where the early recognition of physical signs, such as perianal ecchymosis, may help in making a diagnosis early enough to correct the problem.

One of the cases presented in the article represents a complication of anticoagulation which one must be aware of whenever using anticoagulants. If signs of bleeding from this complication are not recognized early and anticoagulation reversed, the bleeding can be massive and result in a mortality.

Another side effect of retroperitoneal hemorrhage which can sometimes occur is hemorrhage into or surrounding the adrenal glands. This can result in adrenal insufficiency which may become manifest once the bleeding stabilizes.

In general, retroperitoneal bleeding severe enough to produce a "black bottom" represents a massive blood loss, and once this sign is recognized, prompt measures to correct the situation are indicated.

George J. Nemanich, M.D.
Minneapolis, Minnesota

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*Kaplan, Arnold P. et al.: Black Bottom, 60:3:161, 1977.

Innocent Murmurs in Children

This is an excellent review of a very common pediatric problem. All Pediatric Cardiologists are, on occasion, referred a child who has been restricted because of suspected heart disease who in fact has only an innocent cardiac murmur. The guidelines to the diagnosis of an innocent murmur as outlined here by Doctor Moller* should help to avoid mistakenly restricting a healthy child, an error which may, even when corrected, leave the child and his family with some psychological residuals.

Doctor Moller is a recognized national authority on the physical diagnosis of pediatric heart disease. His excellence in the teaching of this subject has been recognized by students at the University of Minnesota Medical School who have on two separate occasions selected him the recipient of the "Distinguished Teacher Award" sponsored yearly at the University by the Minnesota Medical Foundation. This clear concise review of the innocent cardiac murmur problem is characteristic of his exceptional teaching ability.

Douglas D. Mair, M.D.
Rochester, Minnesota

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*See page 281.

Continuing Medical Education

"25 Years of Psychopharmacology"

The Hennepin County Psychiatric Society and Minnesota Academy of Family Practice announce a one-day Continuing Medical Education conference "25 Years of Psychopharmacology, to review the impact of psychotropic drugs on psychiatry and medicine, since chlorpromazine was introduced in 1952. Saturday, June 4, 1977, l'Hotel Sofitel, Minneapolis. Contact: F. S. Abuzzahab Sr., M.D. Ph.D., 818 Fairview-St. Mary's Med. Bldg., 606 S. 24th Avenue, Minneapolis, Minnesota 55454.

Acute Supraglottitis

Dr. Leek* should be congratulated for this timely contribution in which he covered the subject thoroughly.

Adult epiglottitis has been reported more frequently during the last years. This is attributed to the widespread use of antibiotics thus preventing anti-body formation in children.[3] Epiglottitis in adults may have a different clinical picture such as sore throat, may last more than one day before the sudden onset of respiratory distress. In 62 cases of adults, epiglottitis reported during the last 15 years, a mortality rate of 32% is reported.[3] This indicates delay of tracheotomy. The hemophilus influence produces the most severe form of epiglottitis in adults. Eighty-two percent of the patients with this problem did require a tracheotomy. Abscess of the epiglottis may be present in adults which may require surgical drainage.[3]

Culture from the hypopharynx and blood cultures are essential in children and adults because of the Ampicillin resistant, haemophilus influenzae, and also the presence of other bacteria as a causative agent. Twenty-five percent of the children with epiglottitis may have cervical adenitis and also pneumonia in conjunction.[6] The diagnosis of this complication would require longer hospitalization. The rapidity of the onset symptoms, and the presence of meningitis, may indicate a low host anti-body level.[6] A more vigorous therapy with large doses of proper antibiotics in earlier elimination of respiratory distress by tracheotomy or nasotracheal intubation should be considered in these cases.

The lateral roentgenograms of the neck have been reported of value in the diagnosis and also could be used prior to extubation in case that a laryngoscopy is not carried on.[2]

The high mortality rate 21%-80% in nontracheotomized patients illustrates the importance of this procedure in the management of acute epiglottitis.[1,4] The nasotracheal intubation is being used more frequently in recent years since this shortens the hospital stay and extubation can be carried on 36-40 hours.[5] This also would eliminate the rare complications due to tracheotomy.

I agree with Dr. Leek in the management of acute epiglottitis. The choice of tracheotomy and nasotracheal intubation is a difficult one. Each has its advantages and disadvantages. Although whichever method is used, it is the most important factor in determining the outcome. Only time will tell the superiority of each method being used.

Ekrem Gozum, M.D.
Minneapolis, Minnesota

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*See page 233.

References

1. Bass et al.: Acute epiglottitis. JAMA Aug. 5, 1974, 229:6:671.
2. Battaglia & Lockhart: Management of acute epiglottitis by nasotracheal intubation, Am J Dis Child 129:334 March 1975.
3. Hawkins Donald B et al.: Acute epiglottitis in adults. Abstract pages 1211 thru 1220, Univ. of So. Calif. School of Medicine.
4. Johnson et al.: Acute epiglottitis. Arch Otolaryngology 100: 333, November 1974.
5. Milko David A, Marshak Gabriel & Striker Theo W: Nasotracheal intubation in the treatment of acute epiglottitis. Pediatrics 53:5:674, May 1974.
6. Molteni Richard A: Epiglottitis: incidence of extraepiglottic infection. Pediatrics, 58:4:526-531, October 1976.

Changes of Address

Please send in any changes in address to the Minnesota State Medical Association, 101 E. 5th St. #900. St. Paul 55101. The new 1977 roster is being assembled. and address changes should be listed.

Meningococcal Infections—New Types

In the present issue of Minnesota Medicine Breitenbucher and Khan[1] call attention to infections caused by a new type (group Y) of *Neisseria meningitidis*. Nine separate antigenic groups (A, B, C, D, X, Y, Z, 29-E and 135) of this organism have been described. All but three (groups X, 29-E and 135) have been isolated from blood or spinal fluid. Group A strains of meningococci were the most common cause of epidemic infections in the United States prior to 1963. From 1964 to 1967 sulfonamide-resistant group B strains were most frequent, but since then group C strains have been generally found. With the recent use of prophylactic group C polysaccharide vaccine in United States military recruits, since 1972 group Y meningococci have replaced group C as the common cause of meningococcal disease.[2,3] The problem of drug-resistant strains of meningococci has also become important. Sulfonamide resistance is common among groups A, B and C, and now a member of group Y has been found resistant.[1] Resistance to rifampin appeared quickly among group C strains when the drug was used for chemoprophylaxis.

Meningococci are carried in the nasopharynx of a variable proportion of healthy people. During epidemics of meningococcal disease the organisms appear to become more virulent. The factors which account for their virulence are largely unknown. *N. meningitidis,* like *N. gonorrhoeae* and other Neisseria, possess polar fimbriae which allow them to attach to epithelial cells and avoid rapid mechanical removal.[4] Resistance to meningococcal infection seems to be stimulated by inapparent nasopharyngeal infection followed by the appearance of specific antibodies to capsular polysaccharide in the serum.

The antibiotic of choice for meningococcal infections is benzylpenicillin G 250,000 units/kg/day given in equally divided doses every two hours intravenously for at least five to seven days. In individuals allergic to penicillin the best alternative is chloramphenicol. The ethyl succinate ester should be administered intravenously in doses of 12-15 mg/kg every six hours until the patient is able to take the drug by mouth. Chloramphenicol base is then substituted at 10-12 mg/kg orally every six hours for a total treatment course of seven to 10 days.

For chemoprophylaxis of meningococcal infection among close contacts of patients one can no longer rely on sulfonamides because resistant strains are common. Reliance must be placed upon either rifampin (20 mg/kg/day orally for two days) or minocycline (four mg/kg orally daily for four days). Minocycline has been poorly tolerated in some trials; healthy adults may be forced to discontinue its use because of vestibular side effects.

Wendell H. Hall, M.D.
Minneapolis, Minnesota

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*See page 240.

References

1. Breitenbucher RB and Khan MY: Fatal meningococcemia. Minnesota Medicine 60:4:240, 1977.
2. Smilack JD: Group-Y meningococcal disease. Ann Int Med 81:740, 1974.
3. Yee NM, Katz M, Neu HC: Meningitis, pneumonitis and arthritis caused by Neisseria meningitidis group Y. JAMA 232:1354, 1975.
4. Henriksen SD: Moraxella, Neisseria, Branhamella and Acinetobacter. Ann Rev Microbiol 30:63, 1975.

What's Up (Doc)? Come to the Annual Meeting, May 19-20,
Radisson South Minneapolis

Thyrotoxicosis as a Cause of Psychosis

THIS VERY INTERESTING case study documents beautifully a dramatic variant of hyperthyroidism and also of organically caused psychosis. It is interesting that it was a male rather than the more typical "female of the third or fourth decade." All should note the many classical symptoms and physical findings. Nevertheless, this condition can be most deceptive and, when not so florid, can easily go unrecognized.

This patient responded well to propranolol and phenobarbital. One wonders whether the patient may have responded also in the area of disordered mentation (loose associations and paranoid ideation) if chlorpromazine had been added after tachycardia was controlled and the risk of additional tachycardia from chlorpromazine minimized.

As alluded to by the author, the similarity between this patient's symptoms and that of hypomania in manic-depressive psychosis or schizophrenia can be confusing. Euphoria may be the least reliable symptom of hypomania as well. More typical may be the irritable and irritating characteristics of a patient angered by others resistance to him and/or frank fear of him. Hopefully we will be stimulated to diagnose more carefully noting the signs and symptoms of this disease and confirming our suspicions with laboratory assistance.

James D. Swenson, M.D.
Minneapolis, Minnesota

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*Pehling, Greg and Mork, John N: Thyrotoxicosis as a cause of psychosis. Minnesota Med 60:169, 1977.

Small Bowel Obstruction

IN THIS PRESENT day and age of skepticism it is encouraging to read an article by a surgeon reporting on Small Bowel Obstruction, wherein at Miller Hospital in St. Paul one out of three patients with small bowel obstruction were successfully managed without surgery. This should counteract some of the recent reports of "too much unnecessary surgery." For this Dr. Mauer* is to be commended.

There is another side to this coin however, as Dr. Mauer pointed out: partial obstruction from malignancies can get better as well as partial obstruction from adhesions. That such a malignancy could be present is something we all want to keep in mind and diagnose when present. Basically, small bowel obstruction remains a surgical problem and when surgery is obviated by successful conservative management by long tube, short tube, or no tube treatment it should not be at the expense of the patient's long term outlook.

Harrison H. Farley, M.D.
Minneapolis, Minnesota

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*See page 273.

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Adult Hypercholesterolemic	1.0-2.0 mg.	1.0-2.0 mg.	4.0-8.0 mg.	4.0-8.0 mg.
Pediatric Hypercholesterolemic	0.05 mg./kg. body weight	0.05 mg./kg.	0.1 mg./kg. body weight	4.0 mg.
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Description

CHOLOXIN (sodium dextrothyroxine) is the sodium salt of the dextrorotatory isomer of thyroxine. It is chemically described as D-3,5,3′,5′-tetraiodothyronine sodium salt.

Actions

The predominant effect of CHOLOXIN (sodium dextrothyroxine) is the reduction of serum cholesterol levels in hyperlipidemic patients. Beta lipoprotein and triglyceride fractions may also be reduced from previously elevated levels.

Most of the available evidence indicates that CHOLOXIN (sodium dextrothyroxine) stimulates the liver to increase catabolism and excretion of cholesterol and its degradation products via the biliary route into the feces. Cholesterol synthesis is not inhibited and abnormal metabolic end-products do not accumulate in the blood.

Indications

This is not an innocuous drug. Strict attention should be paid to the indications and contraindications.

CHOLOXIN (sodium dextrothyroxine) is an antilipidemic agent used as an adjunct to diet and other measures for the reduction of elevated serum cholesterol (low density lipoproteins) in euthyroid patients with no known evidence of organic heart disease.

The drug is also indicated in the treatment of hypothyroidism in patients with cardiac disease who cannot tolerate other types of thyroid medication.

Before prescribing, note the following: Results from a randomized clinical study have indicated a possible adverse effect when CHOLOXIN (sodium dextrothyroxine) is administered to a patient receiving a digitalis preparation. There may be an additive effect. This additive effect may possibly stimulate the myocardium excessively, in patients with significant myocardial impairment. CHOLOXIN (sodium dextrothyroxine) dosage should not exceed 4 mg per day when the patient is receiving a digitalis preparation concomitantly. Careful monitoring of the total effect of both drugs is important.

It has not been established whether the drug-induced lowering of serum cholesterol or lipid levels has a detrimental, beneficial, or no effect on the morbidity or mortality due to atherosclerosis or coronary heart disease. Several years will be required before current investigations will yield an answer to this question.

Contraindications

The administration of CHOLOXIN (sodium dextrothyroxine) to euthyroid patients with one or more of the following conditions is contraindicated:

1. Known organic heart disease, including angina pectoris; history of myocardial infarction; cardiac arrhythmia or tachycardia, either active or in patients with demonstrated propensity for arrhythmias; rheumatic heart disease; history of congestive heart failure; and decompensated or borderline compensated cardiac status.
2. Hypertensive states (other than mild, labile systolic hypertension).
3. Advanced liver or kidney disease.
4. Pregnancy.
5. Nursing mothers.
6. History of iodism.

Warnings

CHOLOXIN (sodium dextrothyroxine) may potentiate the effects of anticoagulants on prothrombin time. Reductions of anticoagulant dosage by as much as 30% have been required in some patients. Consequently, the dosage of anticoagulants should be reduced by one-third upon initiation of CHOLOXIN therapy and the dosage subsequently readjusted on the basis of prothrombin time. The prothrombin time of patients receiving anticoagulant therapy concomitantly with CHOLOXIN therapy should be observed as frequently as necessary, but at least weekly, during the first few weeks of treatment.

In the surgical patient, it is wise to consider withdrawal of the drug two weeks prior to surgery if the use of anticoagulants during surgery is contemplated.

When CHOLOXIN (sodium dextrothyroxine) is used as thyroid replacement therapy in hypothyroid patients with concomitant coronary artery disease (especially those with a history of angina pectoris or myocardial infarction) or other cardiac disease, treatment should be initiated with care. Special consideration of the dosage schedule of CHOLOXIN (sodium dextrothyroxine) is required. This drug may increase the oxygen requirements of the myocardium, especially at high dosage levels. Treated subjects with coronary artery disease must be seen at frequent intervals. If aggravation of angina or increased myocardial ischemia, cardiac failure, or clinically significant arrhythmia develops during the treatment of hypothyroid patients, the dosage should be reduced or the drug discontinued.

Special consideration must be given to the dosage of other thyroid medications used concomitantly with CHOLOXIN (sodium dextrothyroxine). As with all thyroactive drugs, hypothyroid patients are more sensitive to a given dose of CHOLOXIN (sodium dextrothyroxine) than euthyroid patients.

Epinephrine injection in patients with coronary artery disease may precipitate an episode of coronary insufficiency. This condition may be enhanced in patients receiving thyroid analogues. These phenomena should be kept in mind when catecholamine injections are required in sodium dextrothyroxine-treated patients with coronary artery disease.

Since the possibility of precipitating cardiac arrhythmias during surgery may be greater in patients treated with thyroid hormones, it may be wise to discontinue CHOLOXIN (sodium dextrothyroxine) in euthyroid patients at least two weeks prior to an elective operation. During emergency surgery in euthyroid patients, and in surgery in hypothyroid patients in whom it may not be advisable or possible to withdraw therapy, the patients should be carefully observed.

There are reports that sodium dextrothyroxine in diabetic patients is capable of increasing blood sugar levels with a resultant increase in requirements of insulin or oral hypoglycemic agents. Special attention should be paid to parameters necessary for good control of the diabetic state in dextrothyroxine-treated subjects and to dosage requirements of insulin or other antidiabetic drugs. If sodium dextrothyroxine is later withdrawn from patients who had required an increase of insulin (or oral hypoglycemic agents) dosage during its administration, the dosage of antidiabetic drugs should be reduced and adjusted to maintain good control of the diabetic state.

When either or both impaired liver or kidney function are present, the advantages of CHOLOXIN (sodium dextrothyroxine) therapy must be weighed against the possibility of deleterious results.

Usage in Women of Childbearing Age

Women of childbearing age with familial hypercholesterolemia or hyperlipemia should not be deprived of the use of this drug; it can be given to those patients exercising strict birth control procedures. Since pregnancy may occur despite the use of birth control procedures, administration of CHOLOXIN (sodium dextrothyroxine) to women of this age group should be undertaken only after weighing the possible risk to the fetus against the possible benefits to the mother. Teratogenic studies in two animal species have resulted in no abnormalities in the offspring.

Precautions

It is expected that patients on dextrothyroxine therapy will show greatly increased serum protein-bound-iodine levels. These increased serum PBI values are evidence of absorption and transport of the drug, and should NOT be interpreted as evidence of hypermetabolism; similarly, they may not be used for titrating the effective dose of CHOLOXIN (sodium dextrothyroxine). PBI values in the range of 10 to 25 mcg% in treated patients are common.

If signs or symptoms of iodism develop during CHOLOXIN (sodium dextrothyroxine) therapy, the drug should be discontinued.

A few children with familial hypercholesterolemia have been treated with CHOLOXIN for periods of one year or longer with no adverse effects on growth. However, it is recommended that the drug be continued in patients in this age group only if a significant serum cholesterol-lowering effect is observed.

Adverse Reactions

The side effects attributed to dextrothyroxine therapy are, for the most part, due to increased metabolism, and may be minimized by following the recommended dosage schedule. Adverse effects are least commonly seen in euthyroid patients with no signs or symptoms of organic heart disease; the incidence of adverse effects is increased in hypothyroid patients, and is highest in those patients with organic heart disease superimposed on the hypothyroid state.

In the absence of known organic heart disease, some cardiac changes may be precipitated during sodium dextrothyroxine therapy. In addition to angina pectoris, arrhythmia consisting of extrasystoles, ectopic beats, or supraventricular tachycardia, ECG evidence of ischemic myocardial changes and increase in heart size have been observed. Myocardial infarctions, both fatal and non-fatal, have occurred, but these are not unexpected in untreated patients in the age groups studied. It is not known whether any of these infarcts were drug related.

Changes in clinical status that may be related to the metabolic action of the drug include the development of insomnia, nervousness, palpitations, tremors, loss of weight, lid lag, sweating, flushing, hyperthermia, hair loss, diuresis, and menstrual irregularities. Gastrointestinal complaints during therapy have included dyspepsia, nausea and vomiting, constipation, diarrhea, and decrease in appetite.

Other side effects reported to be associated with CHOLOXIN (sodium dextrothyroxine) therapy include the development of headache, changes in libido (increase or decrease), hoarseness, tinnitus, dizziness, peripheral edema, malaise, tiredness, visual disturbances, psychic changes, paresthesia, muscle pain, and various bizarre subjective complaints. Skin rashes, including a few which appeared to be due to iodism, and itching have been attributed to dextrothyroxine by some investigators. Gallstones have been discovered in occasional dextrothyroxine-treated patients and cholestatic jaundice has occurred in one patient, although its relationship to CHOLOXIN therapy was not established.

In several instances, the previously existing conditions of the patient appeared to continue or progress during the administration of CHOLOXIN (sodium dextrothyroxine); a worsening of peripheral vascular disease, sensorium, exophthalmos, and retinopathy have been reported.

CHOLOXIN (sodium dextrothyroxine) potentiates the effects of anticoagulants, such as warfarin or Dicumarol, on prothrombin time, thus indicating a decrease in the dosage requirements of the anticoagulants. On the other hand, dosage requirements of antidiabetic drugs have been reported to be increased during dextrothyroxine therapy (see WARNINGS section).

Dosage and Administration

For **adult** euthyroid hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is 4 to 8 mg per day. The initial daily dose should be 1 to 2 mg to be increased in 1 to 2 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, if that dosage level is indicated to effect the desired lowering of serum cholesterol.

When used as partial or complete substitution therapy for levothyroxine in hypothyroid patients with cardiac disease who cannot tolerate other types of thyroid medication, the initial daily dose should be 1 mg to be increased in 1 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, preferably the lower dosage. The maximum in patients receiving digitalis therapy is 4 mg.

For **pediatric** hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is approximately 0.1 mg (100 mcg) per kilogram. The initial daily dosage should be approximately 0.05 mg (50 mcg) per kilogram to be increased in up to 0.05 mg (50 mcg) per kilogram increments at monthly intervals. The recommended maximal dose is 4 mg daily, if that dosage is indicated to effect the desired lowering of serum cholesterol.

If new signs or symptoms of cardiac disease develop during the treatment period, the drug should be withdrawn.

How Supplied

CHOLOXIN (sodium dextrothyroxine) is supplied in prescription packages of scored 1, 2, 4, and 6 mg tablets.

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Philosophical Musings of a Surgeon

The No-Fault Syndrome *

Since the advent of the mandatory No-Fault car insurance, companies have observed numerous individuals claiming disabling symptoms which they relate to a car incident. Those individuals who have obtained a signed substantiation from their attending physician are then able to collect tax-free benefits, amounting to 80 percent of their wage, up to a period of ten months. If, in addition, the accident occurred while on the job, they are also able to collect similar expenses from the Compensation Insurance of their employer, as long as the disability lasts. The laws of each state may vary, additionally complicating the No-Fault car insurance pandemonium.

The history reveals that the symptoms developed immediately after the accident; the symptoms may be diverse and legion. The attending physician is asked to confirm, and often reconfirm, the disability which the accident victim maintains; he may thoughtlessly do so as a favor to please his patient, but if he becomes skeptical and refuses, the "accident victim" may obtain a disability approval from his chiropractor.

The insurance company, having the privilege of an independent evaluation, may send the "accident victim" to another physician. In this consultation the patient, with vindicativeness, relates his symptoms to the incident. Any awareness of pre-existing symptoms is minimized, and if the consulting physician persists in obtaining a complete history and doing a complete physical examination, the patient may, with a bit of pique, defer to the extensive checkup of his attending physician. A list of symptoms, procedures, consultations, and therapy are detailed that could be the envy of the most atrabilious hypochondriac: aches and pains in a variety of areas, electroencephalograms, electromyograms, electrocardiograms, numerous Xrays, blood tests, nerve tests, brain scans; neurologic and orthopedic consultations; three or four times weekly physio-therapy, a neck collar to be worn, a brace considered, and "pain pills," tranquilizers and sleeping pills to be taken. (Some individuals were found to have developed a drug reliance syndrome.)

In the No-Fault Syndrome the consulting physician finds no residue of organic injury—no more than a contusion, a strain, a bruise or a sprain which could have caused symptoms for a few days or a few weeks, but not for months on end—though not infrequently he does find preexisting disease. If it becomes unavoidable and the patient must admit previous symptoms, he will relate all aches and pains as having been aggravated subsequent to the specific incident.

The variety of preexisting diseases, as can often be substantiated by the physical findings, the laboratory and x-ray tests, obviously could not have resulted from the accident, but could have produced symptoms which the patient describes. The list of preexisting diseases may be extensive. The most common are physiologic age changes, arthritis, osteoarthritis, myositis, and congenital or developmental abnormalies; not infrequently obesity, pelvic disease, excessive medication or the use of alcohol, hypertension and gout; and in at least one instance I have found hyperthyroidism, hypothyroidism, chondromatosis of the hip joint, generalized osteoporosis, cancer of the breast, hepatitis, parathyroid adenoma, enlarged kidney, appendicitis and gallbladder disease.

If the attending physician has accepted the patient's pronounced etiology as the specific cause of symptoms, and if he does recognize preexisting disease, he may be inclined to speak of it as an aggravation by the relatively minor incident.

If the "disability" goes unchallenged, the patient may continue to receive his tax-free weekly benefits to the limits of the No-Fault policy.

In order to test the sincerity of the victim of the No-Fault Syndrome, abstruse examination is often used. In some of these the calloused hands of the moonlighter disclose a discrepancy in the maintained disability; physical testing of the rotating neck, while examining the ears from right to left, may reveal no resistance; but resistance in direct

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*Given at the meeting of the Minnesota Surgical Society in St. Paul, the Fall of 1976.

examination, or in doing a straight leg raising test, limited elevation is observed at 10 degrees, where as the patient is able to sit on the end of the table with his legs outstretched; or the knee-high flexion test cannot be accomplished in the supine position, though it is adequately attained as the patient sits on the end of the table, not realizing that this has assumed the knee-thigh flexion position.

To the "victim" any incident is an accident, and consequently all subsequent symptoms are interpreted by the patient and his attorney as due to an injury. From a medical standpoint, this, of course, is fallacious reasoning, though occasionally all of us accept the patient's dictum of having been "injured in an accident," and thereby, we have neglected to search for a more logical cause for the patient's lingering ailments.

Doctors of a generation ago found an easy out by imputing the broom handle as a cause for cancer of the breast. Recently a Minnesota Supreme Court upheld a decision which ascribed the contusion sustained on a grocery shelf as the cause of a subsequently observed carcinoma of the breast. The injury theory as a cause for other diseases must surely be abandoned by the medical profession, lest the courts take over the etiology of all diseases.

Injury as well as disease has its own signs, symptoms, duration, healing period and end results; to search for a covert incident or minor injury to account for the etiology of disease merely delays the benefit that might otherwise be obtained.

Strain is the least of these and is comparable to the soreness after an athletic venture. There is discomfort for a few days, but no organic damage has been done and recovery is complete within a week or ten days. *Chronic strain* is the reoccurrence of symptoms from another or analogous incident; I have known it to skip one or more significant incidents in favor of the more remunerative.

Sprain is a bit more strenous, causing swelling and ecchymosis, but there is no organic damage to any tissue. It is comparable to a sprained ankle. The disability may extend for three or four weeks. Recovery is complete, though the plaintiff's attorneys love to point out that a ruptured cell or two may heal into permanent disabling scar.

More extensive are the organic injuries: laceration, ruptured muscular tendons, fractures, avulsions, amputations, and any combination of these. The disability may extend for weeks or months, or it may be permanent.

Preexisting disease may cause a delay in the healing of an injury, but it is extremely tenuous that an injury, per se, causes an aggravation of the preexisting disease. It is entirely possible that the *symptoms of a disease* may be temporarily aggravated, but the disease itself is rarely altered. Xray demonstration of a series of individuals, suffering from backache without injury over a period of years, has revealed the progression of osteoarthritis. Likewise serial discograms have revealed progressive degenerative changes with advancing age.

Specific, and perhaps hyperbolical, examples of this may be the man who stubbed his toe in a car accident and endeavored to attribute his subsequently proven gout to the incident; or the man with vague aches and pains and a host of other symptoms suggestive of hyperparathyroidism, who had a car accident and thereafter endeavored to ascribe the symptoms produced by a parathyroid tumor as originating from the impact of the car accident.

The No-Fault Syndrome in the litigation business appears to be superseding the "whiplash" syndrome.

We, as doctors, must guard against allowing the No-Fault Syndrome to proliferate, lest we, too, eventually become the victims of a No-Fault Malpractice Insurance, which could become Brobdingnagian in its scope.

Carl O. Rice, M.D., Ph.D.
Editor Emeritus

Minnesota State Medical Association Roster

Change of Address: Notice of change of address should be sent promptly to: Minnesota State Medical Association, 101 E. 5th St., Suite 900, St. Paul, MN 55101.

Special Article

Small Bowel Obstruction in a Community Hospital

HENRY GÜNTHER MAUER, M.D.*

One hundred and four consecutive cases of small bowel obstruction (SBO) in a community hospital were reviewed with emphasis placed on comparisons between surgical and non-surgical patients. Clinical presentation, and accuracy of roentgenographic diagnosis were also reviewed. In addition, the operative findings with special attention to closed loop strangulation are discussed. The striking absence of external hernias as a cause for SBO, and the zero mortality in cases of strangulation were important findings. Overall mortality rate was 7.2%.

ADVANCES IN MANAGEMENT and treatment of small bowel obstructions over the last forty years have been a rewarding experience to the physicians confronted with this major problem. Two major factors producing a declining mortality rate have been the use of intestinal decompression as described by Wangensteen,[1] and appropriate pre-operative preparation. In an attempt to define the management and treatment of SBO in the community hospital, a three year review of 104 consecutive cases of small intestinal obstruction was performed, and comparisons between surgical and non-surgical patients noted.

Clinical Material

All patients were under the primary care of their personal physician in Miller hospital, a 370-bed (non-pediatric) facility in St. Paul, Minn. During a 37 month interval from Jan. 1973, 104 cases of SBO were diagnosed and treated. Sixty-five patients were treated surgically and the diagnosis confirmed at laparotomy; thirty-nine patients were managed non-surgically on the basis of clinical and roentgenographic evidence. The patients' ages ranged from 14 to 92; this included 39 males and 65 females (Table 1). In addition, the roentgenographic method of diagnosis was reviewed and compared in surgical and non-surgical patients. Both groups were also compared as to presenting symptoms as well as general status measured in terms of temperature, pulse, and WBC. Particular attention was focused on the age, symptoms, and management of those patients with small bowel strangulation.

The presenting symptoms of all patients are listed in Table 2, and classified according to subsequent management. Pain, most often described by patients as intermittent cramps, was the most common single complaint. This was followed in frequency by nausea and vomiting, a symptom that seemed more prevalent in patients eventually undergoing surgery. Abdominal distension was a major complaint in 26% of both groups. Diarrhea was an infrequent presenting complaint. Auscultation of the abdomen confirmed in nearly all cases the presence of obstructive bowel sounds characterized as borborygmus, rushes or tinkles. These sounds were often reported as accentuated following abdominal palpation.

Comparisons of admission temperature, pulse,

TABLE 1
Sex and Age Distribution in 104 Cases

Sex	Males	Females	Total
Non-surgical	15	24	39
Surgical	24	41	65
			104
Age (mean)	53.8	59.8	57.6
Non-surgical	62.4	67.5	65.5
Surgical	47.7	55.7	53.0

TABLE 2
Comparison of signs and symptoms in surgical and non-surgical patients

Presenting Sx.	Non-surgical	Surgical	Total
Pain	35/39 (90%)	61/65 (94%)	96/104 (92%)
Nausea & Vomiting	18/39 (46%)	42/65 (65%)	60/104 (58%)
Distension	10/39 (26%)	17/65 (26%)	27/104 (26%)
Temp >37.5 (Oral)	4/39 (10%)	12/65 (18.5%)	
Pulse >90	8/39 (20%)	27/65 (42%)	
WBC>11,000	9/39 (23%)	24/65 (37%)	

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See editorial, page 268.

and WBC, of the surgical and non-surgical patients would indicate that the general status of the surgical patient was more threatening. This may be explained by the duration of symptoms prior to hospitalization in patients undergoing surgery opposed to the non-surgical group: 2.8 days versus 1.8 days respectively.

Roentgen exam consisting of an admission flat and upright film of the abdomen was performed on all patients. The diagnosis of mechanical SBO was made in 42 patients (41%) on the basis of this initial study. One patient was discovered to have free air and subsequent laparotomy revealed a perforation of the terminal ileum. In the surgical group, roentgenographic diagnosis yielded an overall accuracy of 66%, when subsequent Barium enema and upper GI studies are included. This is similar to statistics reported by others.[2] A parallel set of statistics are included for the non-surgical patient, indicating a 56% diagnostic certainty (Table 3). All cases of inconclusive diagnosis on the part of the radiologist were excluded.

TABLE 3
Diagnosis based on roentgen exam performed

	Non-surgical	Surgical
Flat and Upright (Abd.)	17/39 (44%)	25/65 (39%)
Barium Enema	1/16	3/15
Upper GI	4/10	12/22
Total	22/39 (56%)	43/65 (66%)

Management

Initial treatment in 66 patients consisted of intestinal decompression: 25/39 (63%) of non-surgical group and 41/65 (63%) of surgical patients. The remainder were kept NPO or allowed only sips of water. Because of persistence of symptoms, all preoperative patients required eventual intestinal suction. Long intestinal tubes were used in only two patients, but both subsequently underwent surgery with failure of symptoms to relent. The infrequency of attempts at intestinal intubation with a long tube was most often based on the physician's bias against this mode of therapy in relieving obstruction, and the frequently cited difficulty associated with its passage and correct positioning. Endoscopic intubation as described by Johnson et al.[3] was not employed in any patient. Parenteral fluids were administered to all patients for purposes of hydration, correction of electrolyte imbalances or antibiotic administration.

Discussion of Operative Findings

The operative findings are listed in Table 4. The number of SBOs secondary to adhesions (54%) is somewhat higher than that reported in other reviews.[2,4,5] This may be supporting evidence for the continual rise of bowel obstruction from adhesive phenomenon, or possibly the earlier surgical intervention when SBO is diagnosed. The mortality and morbidity of delayed operation for strangulation is now common knowledge to the practicing physician.[6,7] The striking absence of external hernias as a cause of SBO in this series, may reflect the higher frequency of elective herniorrhaphy in the community hospital in an effort to avoid the attendant complication of strangulation. Crohn's disease was newly diagnosed in two of the six patients listed and remains an important consideration in the differential diagnosis of SBO.

TABLE 4
Operative findings

Adhesions	35/65 (54%)
Crohn's	6/65 (9.2%)
Internal Hernia	4/65 (6.2%)
Carcinomatosis	3/65 (4.6%)
Volvulus	2/65 (3.1%)
Intussusception	2/65
Stricture (previous bowel anast.)	2/65
Lymphoma	1/65 (1.5%)
Carcinoid	1/65
Ventral Incisional Hernia	1/65
Foreign body	1/65
Free perf. in terminal ileum	1/65
Closed loop strangulation	6/65 (9.2%)

The mean age of the operative group was 53.0 years compared to 65.5 in the non-surgical patients. Six of sixty-five (9.2%) patients were found to have a closed loop strangulation requiring resection. The mean age of this group was 69 years, and all patients had persistent abdominal pain for more than 24 hours despite NG suction. Only one patient was febrile; two patients had WBCs less than 11,000, but both demonstrated a marked shift to the left on the differential count. All patients with strangulation had a pulse rate greater than 100, and all had undergone previous abdominal surgery. The mortality in this group of patients, although smaller in number than in other series was zero. These statistics would imply that age is often a deterrent to operative intervention, yet it is in the elderly patient that early surgery may be the most urgent in prevention of bowel necrosis and its associated high mortality rate.

It is also of note that none of the patients with strangulation received pre-operative antibiotics, but all were treated with either intraoperative or immediate post-operative antibiotics. The possible masking influence of antibiotics on pre-operative evaluation, especially for follow-up WBCs was indicated as the most frequent reason for withholding this form of therapy, despite the importance of their pre-operative use on morbidity and mortality as stressed by Zollinger et al.[7]

Fifty-nine of sixty-five (91%) patients managed surgically had a previous abdominal operation, compared to 28/39 (72%) in the non-surgical group. The most common preceding procedure had been an appendectomy, followed by ulcer operations and intestinal resections, then gynecologic procedures, and finally cholecystectomy. One 76-year-old female had an adhesive SBO fifty-eight years post appendectomy. Eleven of thirty-nine non-surgically treated patients had no previous abdominal surgery, yet clinically and roentgenographically were considered to have SBO. All of these relented without surgery, but the basis of the obstruction remained unclear in many cases. This draws attention to the patient with an obstructing carcinoid diagnosed at laparotomy (metastatic to liver) who had been treated for two prior episodes of SBO over a seven year period with NG suction and subsequent temporary relief of symptoms. Upper GI studies had been normal on two previous occasions in this patient. The implication for close follow up and possible future abdominal exploration in this group is apparent.

Deaths and Complications

Deaths and complications are listed in Table 5. As stated, there were no mortalities in patients undergoing resection for strangulation, and there were no associated wound infections. The overall mortality rate was 7.2%. There were no deaths in the non-surgically treated patients. The three patients with ovarian carcinomatosis and the one with abdominal lymphoma were known to have this diagnosis pre-operatively and succumbed to the disease while hospitalized. The only patient to develop a fistula was noted to have diffuse, dense adhesions at surgery, and the bowel was inadvertently entered on several occasions. He required prolonged hospitalization with hyperalimentation, but subsequently left the hospital with a small closing fistula.

TABLE 5
Deaths and complications

Deaths
3 Ovarian carcinomatosis
1 Dissem. abd. lymphoma
1 Pulmonary embolus
5/65 = 7.2%

Infections
3 Wound
3 Pneumonia
5 Urinary tract

Other
2 Wound hematomas
1 Small bowel fistula
1 Pulmonary embolus

Conclusion

Comparisons of surgical and non-surgical patients confirmed the similarity of presenting symptoms in each group, although the general status of the surgical patient was more "toxic." The roentgenographic accuracy of diagnosis, confirmed in the surgical group, was 66% and parallels that reported by Lo et al.[2] The clinical exam and correlation with roentgenograms remain the essential of diagnosing mechanical small bowel obstruction.

The frequency of adhesions producing SBO remains high, with near total abandonment of long tube intestinal decompression by community physicians as a form of initial treatment. It is this group of patients, however, that may prove to benefit substantially from newer techniques of endoscopic intestinal tube placement. Patients whose symptoms persisted in the face of suction were operated upon; this policy led to no mortalities in the patients with closed loop strangulation in this series. As quoted from Wangensteen, 'The practice of employing suction as a test procedure to indicate whether operation will be necessary leads only to deferment of appropriate treatment.'[1]

References

1. Wangensteen OH et al.: Experience with employment of suction in the treatment of acute intestinal obstruction. Surg Gynec & Obset 68:851, 1939.
2. Lo AM, Evans WE, Carey LC: Review of small bowel obstruction at Milwaukee County General Hospital. Amer J Surg 111:884, 1966.
3. Johnson FW et al.: Rapid long tube intubation of the jejunum by a new endoscopic device. Amer J Surg 131:91, 1976.
4. Sykes PA, Grime RT, Schofield PF: The management of small bowel obstruction. J R Coll Surg Edinb 18:169, 1973.
5. Bollinger JA, Fowler EF: Results of treatment of acute small bowel obstruction. Arch Surg 66:888, 1953.
6. Leffall LD, Syphax B: Clinical aids in strangulation intestinal obstruction. Amer J Surg 120:756, 1970.
7. Zollinger RM, Kinsey DL, Grant GN: Intestinal obstruction. Postgrad Med 33:165, 1963.

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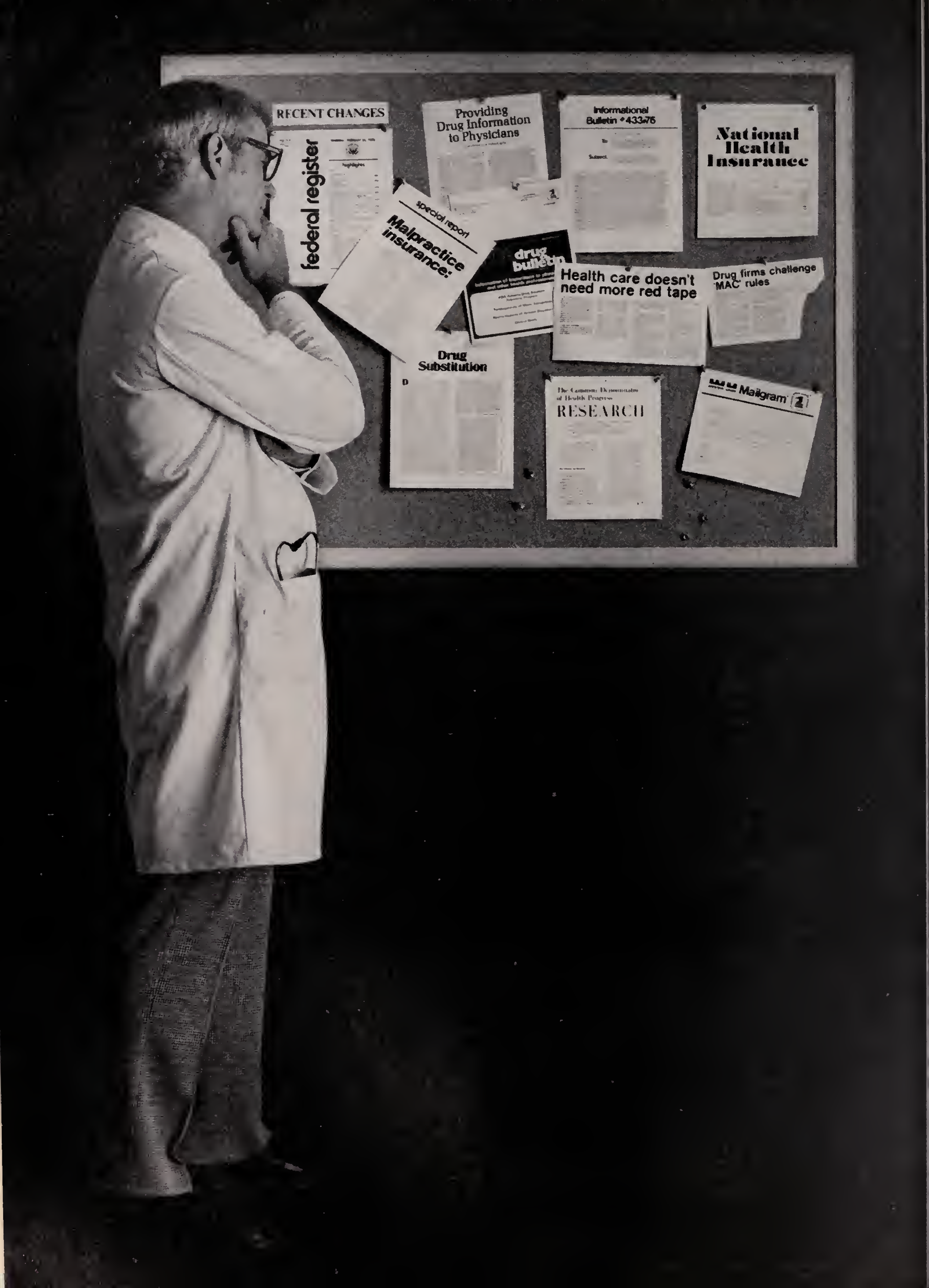
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Ironically, this dilution of physician control has taken place against a background of growing evidence that purportedly equivalent drug products may be inequivalent, since neither present drug standards nor their enforcement are optimal. In fact, the FDA itself says it has not enforced the same standards for hundreds of "follow-on" products that it had applied to the original NDA approvals. Thus physician control over patient therapy is being eroded with a risk that patients may be exposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced prescription prices for consumers. Yet no documentation of any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is a Federal regulation designed to cut the Government's drug bill by setting price ceilings for drugs dispensed to Medicare and Medicaid patients. Unless the prescriber certifies on the prescription that a particular product is medically necessary, the Government intends to pay only for the cost of the lowest-priced, purportedly-equivalent, generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

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Innocent Murmurs in Children

Recognition and Management

JAMES H. MOLLER, M.D.*

Innocent murmurs are common in children. They can be distinguished from significant murmurs by applying the knowledge of five major features and the five types of innocent murmurs.

PHYSICIANS ARE OFTEN faced with a child in whom a cardiac murmur is found. This is a common problem, since nearly half school-aged children at some time will have an innocent murmur. Although in most children the murmurs prove to be innocent, how can they be distinguished from organic murmurs? In the child with a murmur, should further investigative procedures such as electrocardiography or chest Xrays be obtained? Should the child with a murmur be restricted from physical activity? Should the patient be referred?

It is difficult to describe cardiac murmurs so that the reader can then recognize them when he examines the patient. Unfortunately, attempts to record, reproduce or electronically simulate murmurs fall short of realism, but they are better than verbal descriptions. Perhaps the best means of learning about innocent murmurs is having the opportunity to listen and discuss them with an experienced clinician.

It is useful, however, to know about the general characteristics of innocent murmurs and the usual types of innocent murmurs.

What are the characteristics of an innocent murmur?

1. Innocent murmurs are almost always grade III/VI or less and, therefore, are not associated with a precordial thrill. Although louder murmurs are usually organic in origin and associated with a thrill, organic murmurs can also be soft.
2. Innocent murmurs are associated with normal heart sounds. In children particular attention should be directed to the pulmonary component of the second sound. Major cardiac anomalies may be present with only a soft murmur, but usually changes in either intensity or the degree of splitting of the second heart sound are present.
3. Innocent murmurs are associated with a normal-sized heart. A rough estimate of cardiac size can be obtained by palpating the cardiac apex. Normally, it is located at the midclavicular line in the fourth intercostal space in children four years of age or younger and in the fifth intercostal space in children five years of age or older. Remember that cardiac anomalies can be associated with normal cardiac size.
4. Innocent murmurs are not associated with significant cardiac symptoms such as shortness of breath, cyanosis or cardiac chest pain.
5. Innocent murmurs are almost always systolic in timing.

Unfortunately, there is no simple test, such as change in the loudness of the murmur with exercise or position, that allows separation of organic from innocent murmurs. On exercise both innocent and organic murmurs may become louder.

Innocent murmurs of each type vary considerably in intensity. During excitement or with a fever, both situations associate with increased cardiac output; these murmurs usually increase in intensity. This has led on occasion to the erroneous diagnosis of rheumatic fever because of the presence of fever and a loud cardiac murmur.

What are the types of innocent murmur?

Pulmonary Flow Murmur

This midsystolic ejection type murmur (Figure) is located along the upper left sternal border. It is believed related to turbulence of flow through the outflow tract of the right ventricle. It is soft and medium pitched. The murmur might be confused with atrial septal defect since the murmur is similar. It can be distinguished, however, by the characteristics of the second heart sound. In atrial septal defect the components of the second heart sound are widely split and do not vary with respiration. In contrast the pulmonary flow murmur is associated with normal respira-

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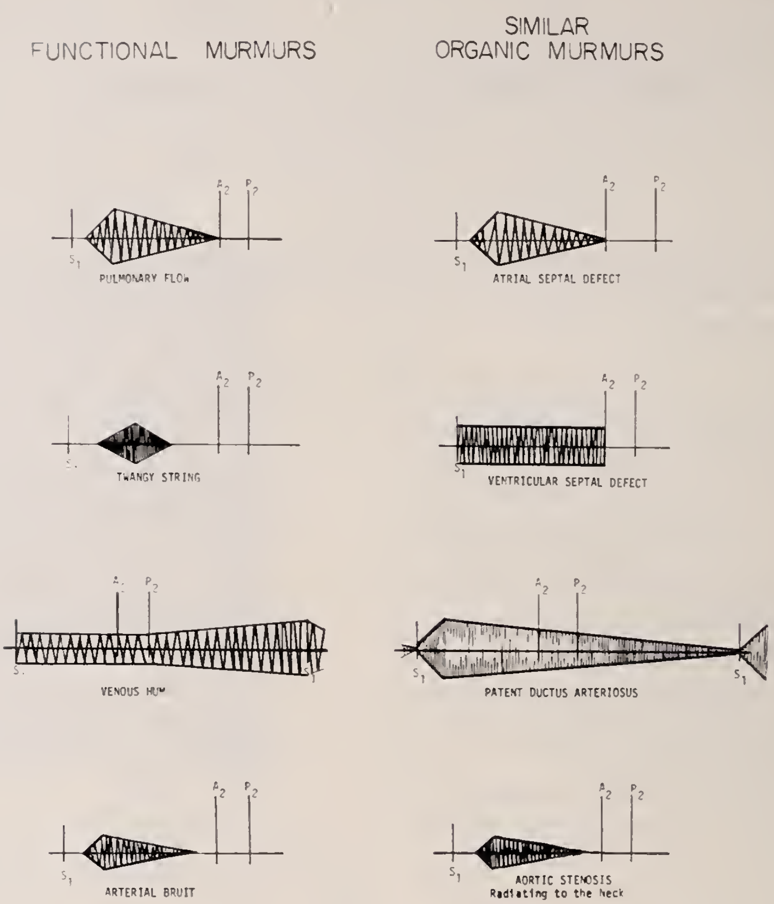
See editorial, page 265.


FUNCTIONAL MURMURS
SIMILAR ORGANIC MURMURS
A_2
P_2
S_1
PULMONARY FLOW
ATRIAL SEPTAL DEFECT
TWANGY STRING
VENTRICULAR SEPTAL DEFECT
VENOUS HUM
PATENT DUCTUS ARTERIOSUS
ARTERIAL BRUIT
AORTIC STENOSIS
Radiating to the Neck

Figure—Diagrams comparing common functional murmur with similar organic murmur. S_1 = first heart sound. A_2 = aortic component of second heart sound. P_2 = pulmonic component of second heart sound.

tory variation (wide splitting with inspiration) of the second sound.

Vibratory Murmur

This common innocent murmur is also called honking or groaning murmur because of the murmur's musical characteristics. It has a very even frequency as opposed to pathological murmurs in which a mixed frequency of sound is present. The murmur is midsystolic, medium pitched (Figure) and located along the midleft sternal border. Because of the location it might be confused with the murmur of a ventricular septal defect, but the latter is usually harsher and may be associated with a thrill.

Venous Hum

This is a continuous murmur (Figure) caused by turbulence of blood flow in the jugular venous system. It can be heard beneath either clavicle, but more commonly the right, and best with the patient sitting. The murmur decreases or disappears when the patient reclines or upon pressure on the jugular veins or upon turning the head from side to side. A venous hum might be confused with a patent ductus arteriosus but the latter is heard better beneath the left clavicle, does not disappear with changes in position and is louder in systole.

Arterial Bruit

A systolic ejection murmur (Figure) may be heard over the carotid artery in the neck of most children. It originates from the bifurcation of the carotid artery. Since nearly every child has such a murmur, the presence of a bruit in the neck should not be taken as prima facie evidence of cardiac disease, such as aortic stenosis.

If a child is considered to have an innocent murmur, usually no further diagnostic studies are needed. The child should be seen at intervals usually dictated by routine pediatric care and does not require special visits because of the murmur.

If a murmur is of questionable origin, an electrocardiogram and posteroanterior chest Xray should be obtained to detect abnormalities. If the cardiac sounds are normal, there are no symptoms and both the electrocardiogram and chest Xray are normal, the probability of significant cardiac disease is very small.

The child with an innocent murmur requires no special care and should be permitted a full range of physical activities. The presence of an innocent murmur should not restrict his ability to obtain insurance.

The parents should be informed of the presence of the murmur and its innocent nature, since in their physician's absence the child may be seen by another examiner who astonishes the parents by noting the presence of the murmur. I do not believe the school should be notified of the murmur, since they may place unnecessary restrictions on the child's activity.

Most innocent murmurs disappear during adolescence. If the murmur persists or after a period of observation is of questionable origin, the child should be referred for further evaluation.

References

1. Castle RF and Craige E: Auscultation of the heart in infants and children. Pediatrics (Suppl Part II) 26:511, 1960.
2. Leatham A: Auscultation of the heart. Pediatr Clin North Am (Nov) 839, 1958.
3. Marienfeld CJ, Telles N, Silvera J and Nordsieck M: A 20-year follow-up study of "innocent" murmurs. Pediatrics 30:42, 1962.
4. Moss AJ: The "incidental" systolic murmur. Pediatrics 45:687, 1970.
5. Weaver WF and Walker CHM: Innocent cardiovascular murmurs in the adult. A 16-year follow-up. Circulation 29:702, 1964.

Selected Aspects of Parkinsonism: Therapeutics—Snyder (page 286).

3. Barbeau A: Six years of high level Levo dopa therapy in severely Akinetic Parkinsonian patients. Arch Neurol 33:333, 1976.
4. Pinder RM, Brogden RN, Sawyer PR, Speight TM, Avery GS: Levodopa and decarboxylase inhibitors: A review of their clinical pharmacological use in the treatment of Parkinsonism. Drugs 11:329, 1976.
5. Martin WE, Lowenson RB, Resch JA, Baker AB: A controlled study comparing trihexaphenydil hydrochloride, plus levodopa with placebo plus levodopa in patients with Parkinson's disease. Neurol 24:912, 1974.
6. Düby SE, Cotzias GC, Papavasiliou P, Lawrence WH: Injected apomorphine and orally administered L-Dopa in Parkinsonism. Arch Neurol 27:474, 1972.
7. Klawans HL and Topel JL: Parkinsonism as a falling sickness. JAMA 230:1555, 1974.
8. Logemann J, Blonsky ER, Voshes B: Editorial. Dysphagia in Parkinsonism. JAMA 231-69, 1975.
9. Porter RW, Bors E: Neurogenic bladder in Parkinsonism: effect of thalamotomy. J Neurosurg 34:27, 1971.
10. Murdock MI, Olsson CA, Sax DS, Krane RJ: Effects of Levodopa on bladder outlet. J Urol 113:803, 1975.
11. Lieberman AN, Goodgold AL, Goldstein M: Treatment failures with Levodopa in Parkinsonism. Neurol 22:1205, 1972.
12. "Do It Yourself Again." American Heart Association, 1969, New York, New York.

Improvements of Silica Gel Fraction for Hypothermic Pulsatile Perfusion—Toledo-Pereyra et al. (page 244).

8. Pattison CP, Hendrian SH and Moziane JF: Transfusion of plasma-protein fraction and renal-allograft rejection. Lancet 2:1483, 1974.
9. Clark EA, Opelz G, Mickey MR and Terasaki PI: Evaluation of Belzer and Collins kidney preservation methods. Lancet I:361, 1973.
10. Aster RH, Miskovich BH, Rodey GE: Histocompatibility antigens of human plasma. Transplantation 16:205, 1973.

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Neurology

Selected Aspects of Parkinsonism: Therapeutics

BRUCE D. SNYDER, M.D.*

Practical aspects of diagnosis and drug treatment of the Parkinsonian patient are reviewed. Additive drug toxicity, autonomic and behavioral aspects of the disease are emphasized.

PARKINSONISM IS A RELATIVELY common neuro-degenerative disorder. With the advent of Levodopa therapy, physicians have become more aware of this condition. In fact, there is a tendency to overdiagnosis of the condition in elderly patients with tremor. The present review is primarily aimed at discussing common pitfalls in diagnosis and treatment of paralysis agitans (P.A.).

Overdiagnosis

Overdiagnosis of PA primarily involves confusion with two entities: essential (benign, familial or senile) tremor or lacunar states with pseudobulbar palsy. Essential tremor is a fine tremor of the hands (and at times head and tongue) seen primarily during postural innervation (such as arm extension). It is not a tremor at rest and is mildly accentuated by intention (as in finger-nose testing). Cogwheel phenomenon (but not rigidity) may be present and may be misleading; cogwheeling is not pathognomonic of Parkinsonism. Essential tremor is identical to the tremor of thyrotoxicosis or anxiety or that resulting from an injection of epinephrine and may respond to mild sedation. It is rarely disabling and only minimally progressive. Family history is frequently positive for similar tremors appearing in adult life. The patient may wish treatment for cosmetic reasons and propranalol (80-160 mg per day) is effective. Only if resting tremor, rigidity or other cardinal features of PA are seen should treatment with L-dopa or anticholinergic agents be used. Some Parkinsonians, in addition to their typical resting tremor, will have a minimal essential or action tremor as well.

The hypertensive patient with multiple cerebral lacunar infarctions may present with rigidity, inexpressive facies, drooling and dysphagia. Tremor is infrequent in these patients; the background history of vascular disease with a history of episodic, stepwise progression of neurologic deficit and the predominance of hyperreflexia, dementia and emotional incontinence should point away from true PA. It should be noted that a recent survey[1] of 100 Parkinsonian patients showed a fairly high incidence of dementia, so-called frontal lobe signs (such as grasping and sucking responses) asymmetrical reflexes and positive Babinski signs. This has been disputed: in a comparison of patients felt to have PA, arteriosclerotic brain disease or senile dementia, less overlap of symptoms was seen.[2] The latter authors felt that rhythmic resting tremor, masked facies, cogwheel rigidity and relatively less dementia helped to distinguish the Parkinsonian patient. Rigidity and bradykinesia may be seen in the pseudobulbar patient or patient with senile dementia and may improve with anti-Parkinsonian drugs. A therapeutic trial is not contraindicated but care must be taken to avoid complications of polypharmacy and drug interactions. The physician has the responsibility of discontinuing ineffective agents as soon as possible.

Other conditions mimic or share features of PA but are relatively uncommon. Idiopathic orthostatic hypotension (Shy-Drager Syndrome) may be a variant of PA and is diagnosed by the prominence of severe orthostatic hypotension and other autonomic symptoms. Cerebellar, spinal cord or brain stem signs may be present. Apathetic thyrotoxicosis and involutional depression may also superficially resemble PA.

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Choice of Therapy: Drugs

Treatment failure with L-dopa has been well documented; 10-20% of patients with fairly typical PA fail to respond to tolerated doses. The well known side effects (nausea, confusion, dyskinesia and orthostatic hypotension) do not usually limit dosage sufficiently to explain these failures. The incidence of nonresponse or of the need for increasing doses of L-dopa correlates with the increasing severity and duration of the disease. No therapy of Parkinsonism modifies the progressive course and natural history of this condition, although death may be delayed and disability forestalled.[3] The use of carbidopa/levodopa combinations has increased patient acceptance by decreasing nausea and vomiting and possibly arrhythmias and postural hypotension.[4] Dyskinesiae and confusional states are not circumvented. Although aggressive drug use may maintain function in these patients, the various drug combinations carry their own risks and benefits should be carefully weighed any time a new drug is added. L-dopa is frequently used in combination with the anticholinergic drugs (Artane[c], Cogentin[c], etc.) but evidence that therapeutic effects are additive is conflicting. A recent study[5] found no additional benefits to the patient from the use of anti-cholinergic drugs with levodopa. Physicians desiring to discontinue such medication should do so slowly and wait until an optimal L-dopa dose has been achieved to avoid severe increases in rigidity which may occur during drug withdrawal. Amantadine hydrochloride is a non-anticholinergic agent; it is not clear whether this drug offers any additive benefit in the patient already on L-dopa.

The side effects of anticholinergic drugs may, unfortunately, exacerbate aspects of the patient's illness. This is true especially regarding bladder dysfunction and confusional states. A patient may enter a vicious cycle of drug-induced psychosis which then elicits further drug therapy in the form of phenothiazines which, in turn, by their anticholinergic properties, worsen both bladder function and psychosis.

Adjustment of L-dopa or carbidopa/levodopa dosage is usually done empirically. It is possible in some selected cases to use apomorphine to decide if the patient will respond to further increments of medication. The test is described in several publications,[6] and consists of preparing apomorphine hydrochloride tablets for injection by mixture with sterile water. One half to one mg is given subcutaneously and the patient re-examined at 15 minute intervals. The drug is short acting and does have an emetic effect. Patients usually become nauseated for a short time and may vomit; this clears quickly, however, and examination after drug administration can demonstrate changes in rigidity, tremor and bradykinesia as well as the appearance and severity of choreoathetoid movement disorder. For example, a patient receiving levodopa might, in response to apomorphine, show little improvement in his Parkinsonism but develop marked dyskinetic movements. Such a patient would probably not benefit from increased dosages of L-dopa. Conversely, a patient not receiving L-dopa but benefiting from apomorphine should be a good candidate for levodopa therapy.

Less Prominent Features of P.A.

The role of abnormal postural reflexes in Parkinsonism has probably not been sufficiently emphasized. Failure of body-righting responses can produce a patient who early in his disease presents with frequent falls and imbalance. Close examination of these patients frequently reveals slight cogwheel rigidity, or some minimal signs of Parkinsonism but the most prominent aspect will be difficulty in maintaining balance, particularly when suddenly pushed or tilted to one side or the other.[7] These symptoms do respond to some extent to standard PA therapy. Visceral and autonomic aspects of PA are also often overlooked and may be life threatening. Dysphagia with aspiration is common in advanced disease, and indeed, pneumonia is a common cause of death in these patients. It is not clear whether medication affects this symptom. Cinefluorographic studies have been performed and recently summarized by Logemann et al.[8]

Both spastic and flaccid neurogenic bladder, not infrequently occur in patients with PA.[9] These patients are subject to increased residual urine volumes and therefore, to recurrent urinary tract infections. Anticholinergic drugs may, of course, worsen function of the hypotonic bladder by producing urinary retention; the patient with uninhibited bladder may be pleased with the decreased frequency and urgency but residual urine volume may increase and must be watched. A cystometrogram may be essential in managing these patients.

Levodopa tends to increase tone in the bladder outlet and can also produce symptoms of urinary hesitancy, frequency and increased residual volume.[10]

Postural hypotension is not infrequent in PA. Opinion varies among neurologists regarding its prominence as a symptom and some prefer to classify atypical PA patients with prominent orthostatic hypotension as an example of Shy-Drager syndrome. Practically, this makes little difference, as the PA features of the disease still seem to respond to L-dopa[11] and no other approach to these features of the syndrome are available.

The orthostatic hypotension itself may be exacerbated by L-dopa but less so by carbidopa/levodopa. Mechanical measures such as elastic hose and bodysuits are effective but poorly tolerated. Families have difficulty getting the disabled patient into the suits and they are too warm in the summer. Ephedrine (75-100 mg a day in divided doses) may be helpful. Fludrocortisone (Florinef[c]) is definitely effective and usually safe if the patient is carefully watched to avoid fluid overload. Doses of .1 mg q.o.d. to .2 mg daily have been used. For patients on long term Florinef[c] therapy, the addition of replacement doses of hydrocortisone may be indicated.

Co-existent conditions, such as diabetic neuropathy, alcoholic neuropathy, sympathectomy, varicose veins, etc. are often major contributing factors in orthostatic hypotension as seen in the Parkinson patient. Nevertheless, available treatment remains fundamentally the same.

Overall Approach: Patient and Family

Mental confusion is a major cause of disability in advanced Parkinsonism. As mentioned, this may be a feature of the disease itself or of drug therapy. This confusion and agitation is marked by lability of mood, paranoid delusions, and impaired planning and logical thinking ability. Treatment is limited to attempting to maintain behavioral control and permit the family or nursing staff to manage the patient. Unfortunately, L-dopa therapy often exacerbates or initiates confusional states; this limits its usefulness in the advanced patient. Phenothiazines exacerbate the movement disorder; thioridazine (Mellaril[c]) is the preferred phenothiazine as its anticholinergic properties minimize its motor side effects. Anticholinergics, in excess, can produce a wild delirium which is worsened by phenothiazines and requires dose reduction. In evaluating increased confusion in these patients drug toxicity should be considered first. It should be recalled that the demented patient will decompensate behaviorally due to changes of routine or surroundings. In hospital regulation can, therefore, be quite difficult.

Certain peculiarities of the disease can make life intolerable for the patient's family. Characteristically, these patients have difficulty rolling over or getting out of bed. Spouses are repeatedly roused for help to bathroom (urinary frequency), etc. Bedrails help give the patient a handhold to maneuver himself with. A bedside commode or even nighttime use of condom catheter may be very useful. Confused patients may need a nighttime restraint to prevent falls. Very useful suggestions for meals, clothing, bathing and other activities are reviewed for the patient (and physician) in "Do It Yourself Again," a booklet of "self help devices for the stroke patients."[12] Many of the suggestions are applicable to the PA patient.

A regular regimen of exercise and activity is essential and coexistent depression should be dealt with. To this end, the use of tricyclic antidepressants are not contraindicated although doses should be adjusted downward for the patient with organic brain disease. Amphetamines are usually not helpful since they tend to precipitate paranoid psychoses in patients who are already taking drugs which can produce this effect. Additionally, tolerance is quick to develop. The patient who is severely depressed can be given a brief (one week) course of amphetamines; good response is diagnostically useful and raises the likelihood of response to tricyclic antidepressants. In selected cases, ECT should be considered in these patients. A combination of bradykinesia and inactivity due to Parkinsonism and added withdrawal and inaction due to depression can be essentially fatal to these patients.

References

1. Martin WE, Lowenson RB, Resch JA, Baker AB: Parkinson's disease. Neurol 23:783, 1973.
2. Parks J, Marsden C, Rees J, Curzon G, Kantamaneni B, Knill-Jones R, Akbar A. Das S, Kataria M: Parkinson's disease, cerebral arteriosclerosis and senile dementia. Qrtly J Med 43:49, 1974.

3-12. Will be found on page 283.

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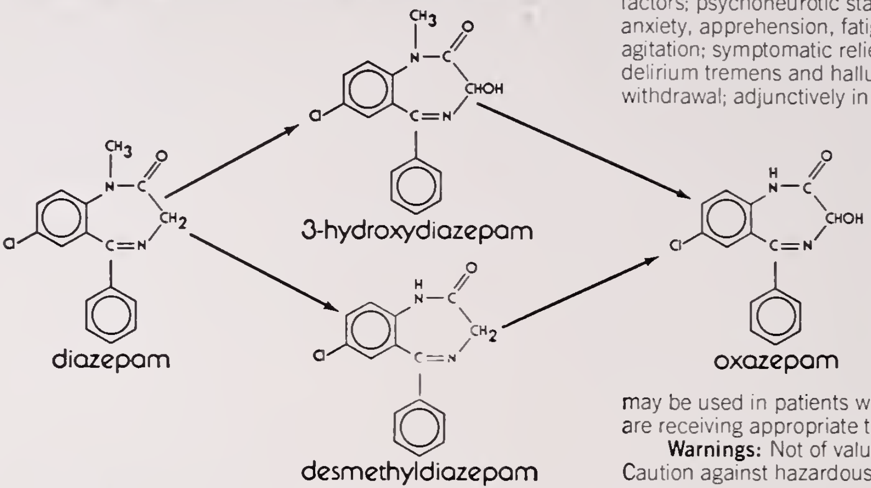

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President's Letter

Involved Unity

The most glaring weakness of our profession noted consistently during my year as President of the Minnesota Medical Association was the absence of the physician in the socio-economic market place. Granted, our credo is to give our patients the best quality of medical care in the shortest period of time for the most reasonable cost, and this has and is a laudable accomplishment among most Minnesota physicians. However, the one-on-one physician-patient relationship is not sufficient in 1977's medical arena. Our patients individually cherish the family physician's total involvement in our most vital unit; the obstetrician delivering that gorgeous and lovable new-born; the neonatologist nurturing the premature to viability; or the cardiac surgeon restoring the blood supply to a starving heart but all the physician's scientific performance with excellence is lost when our government and our media editorialize against us with stories suggesting fraud, abuse, cost escalation, maldistribution, insensitivity, malpractice, overutilization, reduplication, abandonment, etc. And we are not present to defend ourselves.

This was readily apparent at staff meetings, county medical meetings, Congressman Fraser's Health Day, Metropolitan Health Board Meetings, HSA meetings, and legislative hearings. Granted our designated representation on most consumer oriented health planning agencies is small, but our participation in the debate or involvement in the planning process at the task force level is still possible if we are there and present a unified articulate, knowledgeable program with statistical and experience-oriented argument. An example is the excellent work Dr. John Coleman and his Metro Health Force performed on our behalf in arriving at acceptable guidelines for neonatal care in Minnesota. With only two Metro Board members to vote he was able to mobilize 400 physicians to develop and write acceptable guidelines for physicians and our patients. The consumer oriented board accepted our recommendations.

The direction of future health care planning and health care delivery systems is our specific responsibility. We must become informed, and we must participate. We cannot win delegating the responsibility to an elected few or to staff.

The MSMA Councilors and Officers have directed their efforts in the past 18 months to structure our organization to meet these needs. The area with the greatest visibility is the Division of Socio-Economic Affairs which directs its efforts toward resolving legislative issues, monitoring health services areas, implementing research and development, and directing medical service problems. As important, is the newly organized Department of Communications which will strive to communicate our programs to the public and to our members as well. Lastly we will present to the House of Delegates a completely reorganized committee structure within the MSMA which, hopefully, will give us fewer more composite committees staffed with specific detailed direction. The end result will depend on the *unified involvement* of the Minnesota physician.

It has been an exhilarating experience to be your President. I thank you for your cooperation and frequent communications.

Richard E. Anonsen, M.D.
President
Minnesota State Medical Association

Chief Justice Robert J. Sheran, Speaker at Annual Meeting

Justice Sheran

Featured speaker at the May 19 luncheon of the MSMA Annual Meeting will be Chief Justice of the Minnesota Supreme Court Robert J. Sheran.

"Medicine, the Learned Profession—A Business or A Trade?" will be Justice Sheran's topic. He recently stimulated considerable comment among doctors and lawyers at a joint meeting of the Ramsey County Medical and Bar Associations. His presentation to the State Medical Association is expected to be equally enlightening.

Justice Sheran served as Associate Justice of the Minnesota Supreme Court from Jan. 8, 1963 to July 1, 1970 and became Chief Justice Dec. 18, 1973. Prior to that time he was in private practice for nearly 24 years in southern Minnesota and in Minneapolis.

He was graduated from the College of St. Thomas in 1939 and the University of Minnesota. School of Law, in 1939.

Editor's Notebook

Organizations, Bureaucracy, and Medicine

"I meant no harm. I most truly did not. But I had to grow bigger. So bigger I got. I biggered my factory. I biggered my road. I biggered my wagons. I biggered the load . . . And for your information . . . I'm figgering

on biggering
and biggering
and biggering.
and biggering."

The Lorax
Dr. Seuss
Random House, 1971

Last week I spoke on trends in Medicine to the medical staff of the Metropolitan Medical Center in Minneapolis. Without intending to, I depressed the audience. Which was too bad, for my aim was realism, not pessimism.

Perhaps I went astray in the beginning. I opened with a quote from *New York Times* reporter, Harrison Salisbury. In writing a story on Los Angeles, he said: "I have seen the future, and it doesn't work."[1] Anyway, I shall now set things right by saying what I thought I meant.

Physicians and Administrators

In talking to each other in hospital staff rooms, physicians often give one of three opinions: (1) hospital costs are too high because the hospital has too many administrators; (2) we have too much bureaucracy in our society; or (3) the government is taking over the practice of Medicine. Society, in less polite terms, is top heavy with paperwork and paper shufflers.

Administrators, in their turn, assert: (1) costs are too high because physicians make independent decisions, regardless how those decisions influence the functioning and expense of the institution; (2) doctors use bureaucracy as a scapegoat because they can't keep up in their own fields and won't admit their own human limitations; and (3) doctors identify less with specific institutions than with medical culture as a whole.[2] Doctors, in short, are unmanageable.

Rise of Large Organizations

What physicians and administrators are saying becomes more understandable when seen in context of a relatively recent phenomona: the rapid growth of large organizations. Since World War II, we have become a society of big organizations. Every major social task—education, defense, production and distribution of goods, search for new knowledge, and health care—has been assigned to large organizations.[3] And these organizations are run by professionals, who may be called "managers," "administrators," or "executives."

Who would have dreamed, even thirty years ago, that it would take a team of administrators to run a moderately large hospital? But then who would have guessed hospitals would require three employees to care for each patient? Yet hospitals require this many administrators and employees to perform the tasks society demands. Some medical centers even have two chief administrators, one to handle government and regulatory agencies, and the other to administer the institution.[4]

The growth of hospital size and complexity is part of another trend—the growth of public service organizations. In the last thirty years, public service organizations—universities, schools, professional associations, hospitals, health care groups of other kinds, and local, state and national government agencies—have grown much faster than traditional production businesses. Indeed, public service organizations easily account for more than half of the Gross National Product. Look at the growth of total government expenditures alone, i.e. state, local, and federal, since World War II.[5]

Year	Total Government Expenditures as % of GNP
1945	22%
1955	26%
1965	28%
1975	35%

Nature of Bureaucracy

And yet the sad truth is that many public service organizations, particularly those in government, have not performed well enough. Take government's role in medical care. Today, people are less happy with medical care even though government expenditures have more than tripled since 1965.

Why should this be?

Mainly, I think, because of the nature of bureaucracy, rather than the foibles of man.

To begin with, government agencies are paid out of budget allocations from public money. This means: (1) success is measured by the ability to spend one's budget, rather than to produce results for the public; and (2) every last penny of public funds must be accounted for. How does one account for every penny? By setting up elaborate and expensive systems of "forms" and "procedures." In time, these "forms and procedures" become more important than satisfying the public. Loyalty to one's fellow bureaucrats and not upsetting the agency become all important. Also one can never abandon a program. That would upset the agency and its "constituents." The end result of this is predictable: no initiatives, no innovations and no performance.

Revolt of Public

In part, the public has revolted to bureaucracy by electing its first Manager President. Throughout his campaign, President Carter stressed his abilities as a manager, as a person who could reorganize, streamline, and manage "bureaucracy." One of his principle tools, he said, would be "zero-based management," a concept he learned about in an article from the *Harvard Business Review* and which he used in governing Georgia.[6]

I believe it makes more sense to try to understand President Carter as a Manager, rather than as Conservative and Liberal. His managerial background accounts, I think, for his caution about social welfare programs and his tendency to control costs first before launching programs. His recent behavior as a fiscal conservative moved one liberal Democrat to comment; "He talks and acts like a moderate Republican. He seems to care much more about organizational charts and managerial competence than people and programs."[7]

Trends in Medicine

What does all of this have to do with the future of Medicine?

A great deal.

In the first place, the odds are great physicians will increasingly become part of large organizations. These organizations may be free-standing and centralized, such as hospitals or large clinics, or they may be diffuse and decentralized, such as the Greater Minneapolis Health Plan for Physicians. Only large organizations will be able to cope with the paperwork imposed by more government regulations (Certificate of Need, Health Service Organizations), and cost controls by health insurers. I for one, think there will still be independent practitioners, but these practitioners will have to be aware of managerial matters and will have to accept a degree of organizational discipline.

Secondly, I predict President Carter's fiscal conservatism and the government's current poor performance in administering health programs will cause us to have second thoughts about a National Health Bill, perhaps delaying passage for three to five years. It is more likely, according to Columbia University economist, Eli Ginzberg, that we will first have a Catastrophic Health Bill. After all, says Ginzberg, such a bill ". . . would get the politicians off the hook without hooking the United States Treasury."[8]

Thirdly, we're going to hear a lot more from the Health Services Agencies (HSAs). The health planning legislation, the National Health Planning and Resource Development Act of 1974, will begin to take hold. This act, in essence, country. I frankly don't think HSAs will work very well, but they will draw physicians into the middle of the political arena. HSAs will also force contending organizations, e.g. university medical centers and community hospitals, to cooperate and coordinate their activities.

Fourthly, we will hear increasingly strident debates between Health Planners, who are basically economists, and physicians who are not. This debate will focus on what's good for society as a whole versus what's right for the individual patient. These two groups—economists and physicians—speak different languages.

Here, for example, is the language of economists, as applied to Health:[9]

"Limits on health-care resources mandate that resource-allocation decisions be guided by considerations of cost in relation to expected benefits. In cost-effectiveness analysis, the ratio of net health-care costs to net health benefits provides an index by which priorities may be set. Quality-of-life concerns, including both adverse and beneficial effects of therapy, may be incorporated in the calculation of health benefits as adjustments to life expectancy. The timing of future benefits and costs may be accounted for by the appropriate use of discounting. Current decisions must inevitably be based on imperfect information, but sensitivity analysis can increase the level of confidence in some decisions while suggesting areas where further research may be valuable in guiding others. Analyses should be adaptable to the needs of various health-care decision makers, including planners, administrators and providers."[9]

Like it or not, we will have to learn to speak this strange tongue. It is called Decision Analysis, or Cost-Effectiveness Analysis, and may be the basis for what diagnostic equipment e.g. a CAT Scanner, we will use; or what therapeutic procedures, e.g. coronary bypass surgery, we can undertake.

Concluding Thought

The fundamental future issue facing medicine, now upon us, is this: central health planning vs. individual initiatives within pluralistic organizations. Government planners argue that only they have the wisdom and perspective to "allocate increasingly limited resources." Individuals, myself among them, question whether government planners have either the wisdom or perspective to plan for us.

Richard L Reece MD

References

1. Journey in America, Harrison Salisbury.
2. Weisbord MR: Why organization development hasn't worked (so far) in medical centers. Health Care Management Review 1:17, 1976.
3. Drucker F: Management: Tasks, Responsibilities, Practices. Harper & Row, 1973.
4. HCMR Interview: Mr. Inside and Mr. Outside, Health Care Management Review, 1:77, 1976.
5. Shellum B: Big Government: Can We Regain Control, Minneapolis Tribune January 9, 1977.
6. Pyhrr, Peter A: Zero-base budgeting. Harvard Business Review 46:6:111, November-December, 1970.
7. Charting Carter: President proves a fiscal conservative, Irking Lahar, Wall Street Journal, April 7, 1977.
8. Ginzberg E: Paradoxes & trends: An economist looks at Health Care, New Eng J Med, 296:814, 1977.
9. Weinstein Milton C and Stason William B: Foundations of cost-effectiveness analysis for health and medical practice. New Eng J Med 296:716, 1977.

MSMA Annual Meeting

President's Message

There is something for everyone at this year's annual meeting. The range of activities spans from a vast array of highly significant educational experiences to a variety of entertainment and recreation. Our hosts for this 124th Anniversary meeting are the Members and Auxiliary of Hennepin County Medical Society.

You will find this year's scientific assemblies to be especially superb. We have technical information available to suit just about any interest. And, Doctor Robert Semsch and his Subcommittee on Scientific Assembly have added several programs that cover the non-scientific, but equally critical, areas of office practice such as financial planning, malpractice risk management, more effective communications, and others.

Coupled with the opportunity for growth through the educational segments of the program, will be numerous social activities as well as the myriad of entertainment potential available in the Twin Cities.

Tennis and golf tournaments will be held again, beginning Wednesday. We have made special arrangements for seats at the Minnesota Opera. The Thursday evening annual banquet promises to be a grand affair, and for our closing event we will celebrate "An Afternoon in Vienna."

The Councilors, Officers and Delegates of the Minnesota State Medical Association are especially enthusiastic about this year's program. We think you will enjoy yourself and profit from the experience.

Richard E. Anonsen, M.D.
President
Minnesota State Medical Association

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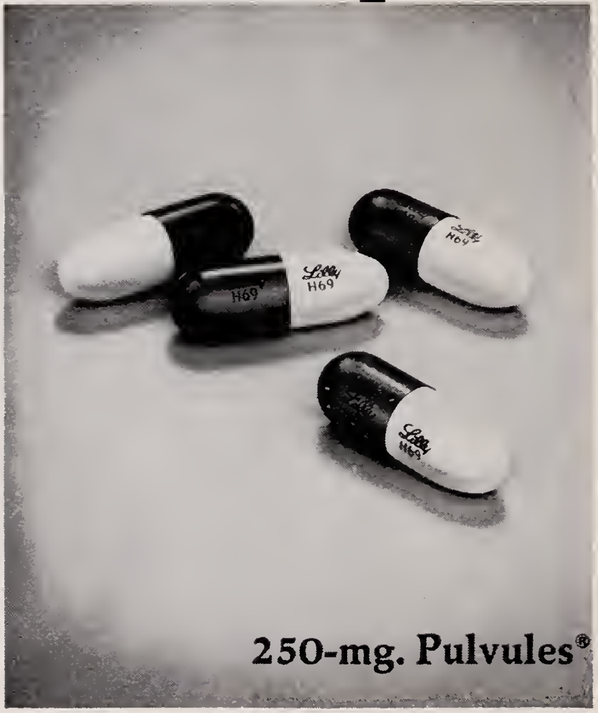

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Prognostic Significance of Chest Pain

Implications for Coronary Bypass Surgery

CHARLES R. PETERSON, M.D.*

To examine the value of symptomatic classification for the selection of patients for coronary artery bypass surgery, three-year mortality comparisons were made between symptomatic groups of patients, as well as sub-groups of patients who did and did not have bypass surgery. The results indicate there is a relationship between symptoms and risk because patients with class 3-4 angina have the highest probability of left main or multiple vessel coronary artery disease. Coronary artery bypass surgery appears more likely to reduce mortality in patients with class 3-4 angina than in lesser or atypical symptomatic groups.

CHEST PAIN IS ONE of the common complaints for which patients consult their physician. This is probably due to the general knowledge that heart disease is a leading cause of death and a common cause of chest pain. Selective coronary arteriography provides accurate definition of coronary artery occlusive disease. There are theoretical reasons for considering coronary bypass surgery on any patient with significant proximal coronary artery narrowing. However, until it is established that coronary bypass surgery can favorably affect prognosis, there is no purpose in doing coronary arteriography on *all* patients with suspected or proven coronary artery disease. Therefore most physicians select for coronary arteriography primarily those patients whom they wish to consider for surgical relief of incapacitating angina.

This report examines the prognostic significance of categorizing patients into three symptomatic groups by comparing the mortality in each group three years after the initial examination. The process of selecting patients from these groups for coronary bypass surgery is also evaluated.

Patients and Methods

Six hundred and eighty consecutive patients under the age of 70 examined because of suspected or proven coronary artery disease were classified into three symptomatic groups on the basis of *clinical* evaluation and *examination.* The three categories are listed in Table 1. In this report, patients with "unstable" or "pre-infarction" are included in Group III. There were 516 men, average age 52.6 years, and 164 women, average age 54.2 years. Patients not included in this report are those with cardiomegaly and clinical heart failure, and patients with other significant cardiopulmonary conditions (valvular heart disease, emphysema, etc.). Sixty percent of the patients were examined initially in the office, and the rest in hospital. Seventy-eight survivors of acute myocardial infarction examined initially in a hospital were classified symptomatically three to six months after discharge.

TABLE 1
Diagnostic Classification:
Coronary Artery Disease (CAD)

GROUP I	**DOUBTFUL CAD.** Atypical symptoms or chest distress; ECG normal or with non-specific abnormality; negative exercise ECG.
GROUP II	**CAD, MINIMALLY SYMPTOMATIC (Class 1-2).** Asymptomatic or angina with more than normal non-strenuous daily activities, with or without previous myocardial infarction; normal or abnormal exercise ECG. Rare use of nitroglycerine.
GROUP III	**CLASS 3-4 ANGINA.** Frequent angina with normal, non-strenuous daily activities or at rest, with or without previous myocardial infarction; normal or abnormal exercise ECG. Frequent use of nitroglycerine.

Exercise Electrocardiography

Exercise electrocardiography was performed on

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Follow-up information obtained with the aid of funds provided by the St. Louis Park Medical Center Research Foundation.

See editorial, page 355.

a treadmill by increasing speed and grade to attempt to achieve 80% of maximum predicted heart rate or a minimum heart rate of 140/minute by five minutes of exercise unless symptoms or ECG abnormalities required that the test be terminated sooner. The test was considered abnormal if the ST depression was 1 mm or more and the depressed segment was horizontal or sloping downward. If the control ECG had ST-T abnormalities, 2 mm ST depression was required for an abnormal response. Equivocal changes were considered normal for purposes of this study.

Selective Coronary Arteriography

Patients with doubtful coronary artery disease (Group I) had selective coronary arteriography performed primarily if there was a strong "need to know" that coronary artery disease was or was not present. There were usually atypical symptoms in patients where there were psychological or administrative reasons for excluding coronary artery disease. Patients with minimally symptomatic coronary artery disease (Group II) usually had coronary arteriography performed because atypical chest distress or angina developed or increased after the initial examination. Most patients with class 3-4 angina (Group III) were advised to have selective coronary arteriography performed after a trial of medical therapy with the understanding that revascularization surgery would be considered if there was not satisfactory relief of angina.

Patients were classified into arteriographic groups on the basis of the number of the three main coronary systems which had greater than 50% narrowing of the dominant proximal arterial segments.

Coronary Artery Bypass Surgery

The primary indication for coronary artery bypass surgery in this group of patients, initially examined between 1969 and 1973, was relief of angina which in the patient's judgment was not satisfactorily controlled with medical therapy. Most of the patients in Group II who eventually had coronary bypass surgery did so because angina became worse some time after the initial evaluation. The average interval between the initial examination and bypass surgery for the patients in Group II was 11 months. Most of the patients in Group III had surgery because there was unsatisfactory control of angina with medical treatment. The average interval between the initial examination and surgery for patients in Group III was three and a half months.

One surgeon was the primary cardiac surgeon in 71 of the patients who had coronary artery bypass surgery. These 71 patients had 171 bypass grafts and four of these patients had ventricular aneurysmectomies or infarctectomies. The other 27 patients had 49 bypass grafts done by 10 other cardiac surgeons, and all but five patients had surgery in Minneapolis hospitals. The utilization of autogenous reversed saphenous veins was the most common technique employed, although 17 patients had direct anastomoses of internal mammary artery to the anterior descending coronary artery, and in one patient homozygous venous grafts were used.

The surgical philosophy applied to most patients in this series was to consider patients with severe proximal narrowing of multiple coronary arteries, good distal vessels (i.e., good distal "runoff"), and good ventricular function the best candidates for coronary bypass. Since many patients are not ideal, the minimum requirement was to have at least one coronary artery that was suitable for bypass and at least fair ventricular function. At the time of surgery, however, total revascularization of all significantly narrowed coronary arteries was attempted. Consequently, grafts were often applied to coronary arteries which had

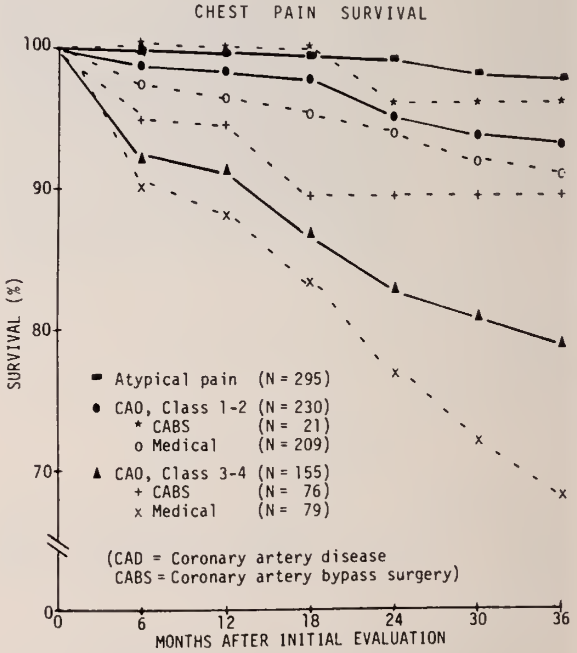

Figure 1

severe distal occlusive disease or were totally occluded proximally. This approach may have increased the number of bypass grafts which would close postoperatively.

Patient Follow-up

Patients not examined regularly were mailed questionnaires asking about symptoms and evidence of a recent heart attack, and those who did not return the questionnaire were contacted by phone. Follow-up was 98% complete. Most of the patients also had a one-year follow-up survey.[1] All patients initially in the study were included in the three-year follow-up. For statistical comparison, all patients remained in the group where they were initially classified, even if the diagnosis or symptomatic class later changed.

Results

Comparative Mortality and Arteriography

The clinical and arteriographic groupings of all 680 patients are tabulated in Table 2, with deaths occurring in the three-year follow-up period indicated in parentheses. If the medical and surgical sub-groups are combined, the three-year mortality percentages for groups I, II and III were 2%, 7% and 21% respectively (Figure 1). These differences are statistically significant at the 0.015 probability level.

The proportion of patients studied by selective coronary arteriography increased as the symptoms of chest discomfort were more typical of angina and provoked by less activity. Only 15% of the patients with atypical chest distress (Group I) were studied arteriographically, increasing to 32% of the patients with minimally symptomatic coronary disease (Group II), and 77% of the patients with class 3-4 angina (Group III).

Arteriographically there are distinct differences in the prevalence of severe coronary artery disease among the three clinical groups. Less than 10% of the patients with atypical symptoms had demonstrable coronary disease. Less than 20% of the patients classified as minimally symptomatic coronary disease had three vessel disease, whereas over 50% of the group of patients with class 3-4 angina had three vessel coronary artery disease. (Patients with significant left main narrowing were considered to have three-vessel disease.)

Doubtful Coronary Artery Disease (Group I)

Most of the patients with doubtful coronary artery disease had chest distress of unknown cause which usually was attributed to musculoskeletal chest disorders. Other patients had diseases of the cervical spine, esophagus, pleura, gallbladder, or the gastrointestinal tract. Some had cardiac arrhythmias as a probable cause of symptoms. The electrocardiographic characteristics of Group I are listed in Table 3.

TABLE 3
Doubtful Coronary Artery Disease
Three Year Follow-up of 295 Consecutive Patients
Routine Electrocardiogram

ECG	Number of Patients	Deaths
Normal	218	3
Non-specific ST-T abnormality	29	2*
Left bundle branch block	8	1
Right bundle branch block	3	0
Ventricular premature beats	14	0
Atrial fib. or parox. at. tach.	23	1*
TOTALS	295	6* (2%)

*One patient had both atrial fib. and STT abn.

TABLE 2
Comparative Three Year Mortality
Medical vs Surgical and Clinical vs Arteriographic Classifications

	Patients Not Studied By SCA	Patients Classified by Number of Diseased Coronary Arteries*								
		0	1		2		3		TOTALS	
	MED	MED	MED	CABS	MED	CABS	MED	CABS	MED	CABS
I. Doubtful CAD	251	40	2	1	1	0	0	0	294	1
Deaths ( )	(6)	(0)	(0)	(0)	(0)	—	—	—	(6)=2%	(0)=0%
II. CAD, Class 1-2	156	8	28	6	13	8	4	7	209	21
Deaths ( )	(12)	(0)	(0)	(0)	(2)	(0)	(1)	(1)	(15)=7%	(1)=5%
III. CAD, Class 3-4	36	3	8	6	16	23	16	47	79	76
Deaths ( )	(11)	(0)	(0)	(0)	(5)	(3)	(8)	(5)	(24)=30%	(8)=11%
Totals		51	38	13	30	31	20	54		
Deaths ( )		(0)	(0)	(0)	(7)	(3)	(9)	(6)		
Mortality (%)		0%	0%	0%	23%	10%	45%	11%		

*Greater than 50% narrowing of proximal vessel or dominant proximal branch.
Abbreviations: SCA = selective coronary arteriography
MED = medical treatment
CABS = coronary artery bypass surgery
CAD = coronary artery disease

There were six deaths within three years in the group of 295 patients with atypical symptoms (0.7%/year). Only one of the deaths was apparently due to coronary artery disease, and two deaths were known not to be due to coronary disease (lung cancer and pulmonary embolus). In response to one-year follow-up questionnaires, two patients described continuing chest discomforts which were more typical of angina than at the time of initial examination, but neither patient returned for re-evaluation, and both died between two and three years after initial examination.

Five of the six deaths in this group of patients occurred in the 91 patients who did not have exercise ECGs, and the one death in the 204 patients who had exercise ECGs was due to a pulmonary embolus (Table 4). Exercise electrocardiography did not exclude coronary artery disease, however, as six of the patients who had "normal" exercise ECGs developed evidence of coronary artery disease within three years. One patient had an abnormal exercise ECG when repeated a year later, three patients had non-fatal myocardial infarctions within three years, and two patients later had abnormal coronary arteriograms. Forty-four patients (9%) with atypical symptoms had coronary arteriography later and four were found to have coronary disease, but three of the four had only single vessel disease.

Only one patient of the 295 patients with atypical symptoms had coronary bypass surgery within three years of initial examination. This was a 58-year-old man who had documented paroxysmal atrial tachycardia associated with mild chest distress, but a negative exercise ECG. He was evaluated later in another state and coronary arteriography disclosed single vessel coronary artery disease which was surgically bypassed. The patient continues to have the cardiac arrhythmia.

The 2.4% death rate in the patients in Group I who did not have coronary arteriography is not significantly different from the zero death rate in patients who *did* have coronary arteriography.

TABLE 4
Doubtful Coronary Artery Disease
Three Year Follow-up of 295 Consecutive Patients
Exercise Electrocardiogram

	Number of Patients	Deaths
Exercise ECG not done	91	5 (5.5%)
Normal Exercise ECG	204*	1† (0.5%)

*During three year follow-up:
One patient later had abnormal exercise ECG.
Three patients had non-fatal myocardial infarctions.
Three patients had abnormal coronary arteriograms.

†Autopsy confirmed death due to pulmonary embolus; no evidence of coronary disease.

Coronary Artery Disease (Groups II and III)

All patients in Groups II and III were thought to have coronary artery disease on the basis of evidence of previous myocardial infarction, typical angina pectoris, ECG evidence of unstable angina, and/or an abnormal exercise ECG. Eleven of the 385 patients in these two groups did not have coronary disease by later anteriography. In most of these 11 patients the symptoms were atypical, but routine or exercise ECGs were abnormal enough to make coronary disease seem likely.

About half of the 385 patients in Groups II and III had a previous myocardial infarction (Table 5). In Group II, 66% of the patients had a previous myocardial infarction as compared to 30% of the patients in Group III. However, the mortality rate in the two groups was not proportional to the previous myocardial infarction rate (7% in Group II, 30% in Group III). Thus, the symptomatic classification appeared to be a better predicator of death than evidence of a previous myocardial infarction. The combination of angina and previous myocardial infarction in class 3-4 patients appeared to be especially ominous (42% three-year mortality).

TABLE 5
Effect of Previous Infarction on Three-Year Mortality (385 Patients)

	Old MI	Deaths	No MI	Deaths
II. CAD, Class 1-2				
Medical	139	9 (6%)	70	6 (9%)
Surgical (CABS)	6	1 (17%)	15	0 (0%)
III. CAD, Class 3-4				
Medical	24	10 (42%)	55	14 (25%)
Surgical (CABS)	24	4 (17%)	52	4 (8%)
TOTALS	193	23 (12%)	192	22 (12%)

About half of the patients in Groups II and III had exercise ECGs, and those patients with abnormal exercise ECGs had a higher three-year mortality. Seventeen percent of those patients with abnormal exercise ECGs treated medically died within three years as compared to 5% of those with negative exercise ECGs and 11% of those patients who did not have exercise ECGs.

A comparison of the three-year mortality of the minimally symptomatic group of patients with the class 3-4 angina group is displayed in Figure 1 (solid symbols and lines). Patients with class 3-4 angina had a three-year mortality almost three times that of minimally symptomatic patients.

Within Groups II and III, there was no significant mortality difference between medically treated patients who did and did not have coronary arteriography (Table 2). It might have been suspected that patients who did *not* have arteriography were those who had better medical control of angina making them a lesser risk group; however, there is no evidence to support such an assumption.

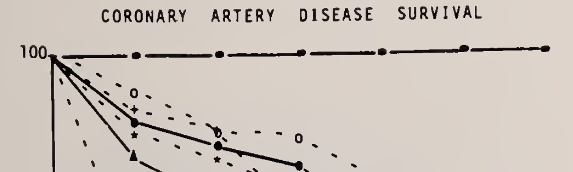

Figure 2

In Figure 2, patients who had coronary arteriographic studies are grouped according to the number of significantly narrowed coronary arteries (solid symbols and lines). Three vessel disease is clearly the highest risk group among those patients who had selective coronary arteriography. It is apparent that the relationship of risk to symptomatic classification of patients (horizontal columns of Table 2) is an average of the proportion of patients in each symptomatic group with single, double, and triple vessel coronary disease (vertical columns of Table 2).

Coronary Artery Bypass Surgery

Those patients examined during the first years of coronary artery bypass surgery revealed 9% who were initially minimally symptomatic, and 49% of those with class 3-4 angina had coronary artery bypass surgery within three years. A comparison of the total surgical mortality (operative and late) with medically treated patients is displayed in Figures 1 and 2 (hatched lines). There were six operative and three late deaths in the 98 surgically bypassed patients.

Figure 1 compares medical and surgical mortality within symptomatic groups, and Figure 2 makes a similar comparison within arteriographically comparable groups (hatched lines). The most striking difference in mortality between medically treated and surgically bypassed patients was in patients with three vessel disease (45% vs. 11%). The 30% vs. 11% difference between medical and surgical mortality in symptomatic Group III is accounted for mostly by the large number of patients in Group III with three vessel disease, most of whom had bypass surgery. The group of patients with three vessel disease who were treated surgically had a three year mortality about one-third that of the 36 patients with class 3-4 angina who never had coronary arteriographic studies.

Patients who had coronary artery bypass surgery did not routinely have postoperative angiographic studies. However, 18 of the 98 patients did have repeat studies an average of 13 months after surgery. The reason for repeat study in most cases was a recurrence of angina after surgery, though it was usually less than preoperatively. This group of 18 patients, therefore, might be expected to represent a group with a less than average technical result from the surgery. These 18 patients had an average of 2.1 bypass grafts per patient, and postoperatively (10 months) had an average of 1.6 patent grafts per patient. They had rest and exercise left ventricular end-diastolic pressure measurement pre-and post-operatively. As indicated in Table 6 there was an abnormal rise in LVEDP preoperatively which was not present post-operatively despite equivalent increases in heart rate with exercise. This suggests a significant increase in coronary perfusion despite less than ideal symptomatic improvement from surgery.

Part of the reason for postoperative angina despite patent grafts was coronary disease distal to the graft anastomosis. Figure 3 demonstrates a well-functioning venous graft to an A-V circumflex coronary artery with significant coronary narrowings beyond the graft.

About 85% of the 92 surviving surgically bypassed patients had significant reduction or complete relief on angina following surgery. Many patients had excellent long-term results from surgery. In one patient who was restudied five and a half years after surgery, all four venous bypass grafts were patent (Figure 4).

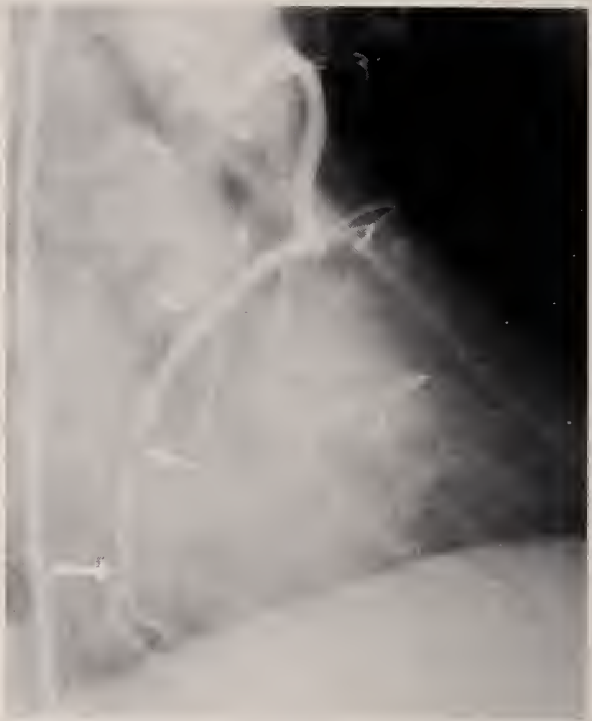

Fig. 3—Selective angiogram of venous bypass graft to AV circumflex coronary artery showing areas of significant obstruction (arrows) distal to the anastomosis.

Discussion

This report describes an approach to selecting patients for selective coronary arteriography and

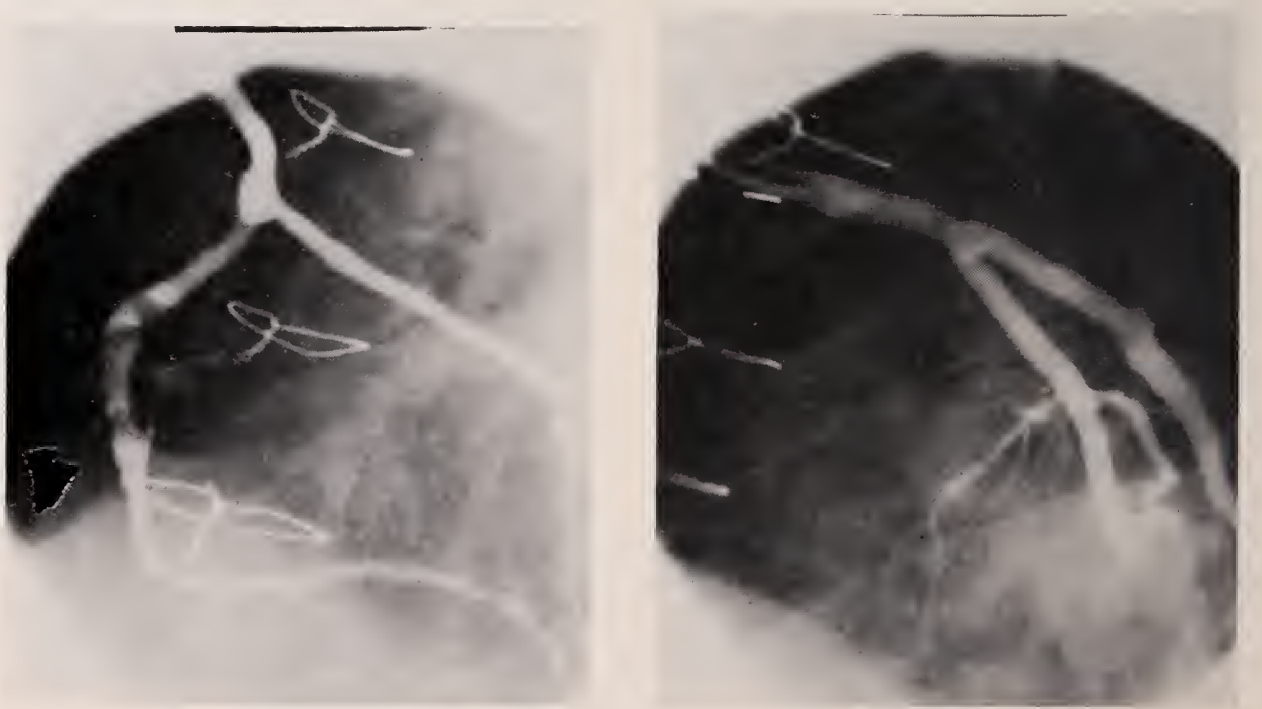

Fig. 4—Selective angiograms of venous bypass grafts to the right, anterior descending (A-left) diagonal, and AV circumflex (B-right) coronary arteries five and a half years after surgery.

TABLE 6
Rest and Exercise
Left Ventricular End-Diastolic Pressure
(18 Patients)

	Before CABG	After CABG*	P
Heart Rate/min			
Rest	72 ± 12	71 ± 13	> 0.5
Exercise	92 ± 13	97 ± 14	> 0.1
LVEDP (mm Hg)			
Rest	12.6 ± 5	11.4 ± 4	> 0.2
Exercise	20.1 ± 7	13.2 ± 6	< 0.01

*Thirteen months after surgery (mean)

bypass surgery which first classifies patients with chest distress syndromes or documented coronary artery disease into three symptomatic groups. Coronary arteriography was considered indicated where there was a need for more accurate diagnosis, and coronary bypass surgery was recommended primarily for relief of incapacitating angina. No assumptions were made about the effect of surgery on reducing long range mortality.

The results indicate that classification of patients with known or suspected coronary artery disease is helpful in determining prognosis. The correlation between varying symptoms and risk is related primarily to the correlation of risk with the number of proximally narrowed coronary arteries. In this study the prevalence of three vessel or left main coronary artery disease was higher in those patients whose symptoms were more typical of angina and provoked by less activity.

An important question is whether the results of this follow-up study indicate a need to change the indications for coronary bypass surgery from those applied to this group of patients. The results offer no evidence that prompt study of a greater proportion of patients with atypical chest distress or minimally symptomatic coronary disease and negative exercise ECGs would significantly reduce mortality. Periodic reassessment of symptoms and repeat exercise electrocardiographic studies with emphasis on control of risk factors is appropriate management of such patients. If there is an increase in symptoms or a marked change in the exercise ECG (especially if there is diffuse or 2 mm ST depression), prompt coronary arteriography should be recommended.

It is unlikely that coronary bypass surgery can reduce the mortality in patients with single vessel coronary artery disease, although bypass surgery may be recommended to provide relief of angina. In this study, there were no deaths within three years in any patient with single vessel coronary artery disease, whether treated medically or with single vessel coronary bypass surgery.

The threefold difference in mortality between the medical and surgical group of patients who initially had class 3-4 angina deserves scrutiny. This difference suggests that medical treatment does not significantly alter the natural history or coronary artery disease once it has progressed to the point of severe multiple vessel narrowing, even if angina is satisfactorily controlled. The results also suggest that coronary artery bypass surgery, as applied to the majority of patients in this series, effects a significant reduction of mortality, particularly in patients who have multiple vessel coronary artery disease.

The mortality comparisons in this study are not between randomized groups of patients; therefore, one or more factors may have biased the results by selection of lower risk patients for surgery. Nevertheless, average age or incidence of previous myocardial infarction was not significantly different in the surgical as compared to the medical patients with class 3-4 angina. Impaired ventricular function worsens prognosis and increases surgical risk.[2-4] Three patients in this study were advised against surgery because of three vessel distal coronary narrowing and diffusely impaired ventricular function, and two of these patients died within three years. A detailed comparison of ventricular function has not been done but a number of the surgically bypassed patients also had significantly impaired ventricular function. The akinetic or dyskinetic areas were usually quite localized but in four patients aneurysmectomies or infarctectomies were done at the time of coronary bypass surgery. One of these patients died at the time of surgery.

The fact that follow-up began from the date of initial evaluation but surgery was usually some months after this date tends to bias mortality results against the medically treated group. Not only is the follow-up period after surgery several months shorter than the full three years of the medical group, but deaths in the first few months of a medical trial removed some high risk patients from the possibility of surgery. On the other hand, the slopes of the mortality curves for medically treated patients with class 3-4 angina or three vessel disease after the first six months remain consistently greater than that of the surgical group of patients (Figures 1 and 2). In addition, some of the surgical patients have now been followed for as long as six years after surgery, and the author is aware of only one late surgical death after the three-year follow-up period.

The severity of coronary disease should have increased the risk in the surgical group. Other studies have also demonstrated that mortality rates from coronary disease are related to the number of significantly occluded major coronary arteries.[5-7] Annual mortality rates for patients without heart failure have been defined at about 2% for single vessel disease, 8% for double vessel disease, and 12% for triple vessel disease. Using comparative analysis of the 186 patients with arteriographically demonstrated coronary disease, the surgical group had proportionally twice as many patients with three vessel disease (55% vs. 24%), and one-third as many patients with single vessel disease (12% vs. 42%). This disproportion would be expected to affect adversely the mortality of the surgical group; however, the three-year operative and late surgical mortality was half that of the medical group (9% vs. 19%).

Despite these considerations it is not valid to conclude from this study that surgery reduces mortality from coronary artery disease. When selection is non-randomized, there is a natural tendency to postpone surgery in poor risk patients and encourage surgery in good risk patients. Randomized studies have demonstrated insignificant mortality differences between medically and surgically treated groups of patients.[8-9] In the matching study reported by McNeer, only those patients with three vessel disease and abnormal ventriculograms had a significantly better survival with bypass surgery than a cohort of medically treated patients.[4] If bypass surgery can improve the prognosis in any sub-group of patients with coronary disease, the most likely would be those at high risk of dying.

Patients with class 3-4 angina have the greatest probability of multiple vessel or left main coronary artery disease, the worst prognosis, and the best potential for symptomatic improvement from coronary artery bypass surgery. In this series, 85% of the patients who had bypass surgery had substantial reduction or elimination of angina. Of the 76 patients with class 3-4 angina who were treated medically, 24 were dead within three years. Fifteen of these patients who died were under age 60, and most appeared to be good candidates for bypass surgery.

These findings have caused the author to liberalize the indications for coronary arteriography in patients with class 3-4 angina. Coronary arteriography is now recommended for all patients who have angina occurring with nonstrenuous daily activity or at rest. Those patients who have left main or multiple vessel coronary artery disease are encouraged to have coronary bypass surgery, irrespective of how well symptons are controlled medically. Control of blood pressure, weight, diet, smoking, exercise, etc., are considered important in the postoperative as well as the preoperative periods. Rest and pharmacological therapy are important in stabilizing the patient with class 3-4 angina until surgery.

References

1. Peterson CR: Clinical and invasive studies of coronary artery disease. One-year follow-up of 505 patients. Minn Med 56:944, 1973.
2. Ross RS: Ischemic heart disease: an overview. Am J Cardiol 36:496, 1975.
3. Burggraf GW, Parker JO: Prognosis in coronary artery disease. Angiographic, hemodynamic, and clinical factors. Circulation 51:146, 1975.
4. McNeer JF, Starmer CF, Bartel AG, Behar VS, Kong Y, Peter RH, and Rosati RA: The nature of treatment selection in coronary artery disease. Experience with medical and surgical treatment of a chronic disease. Circulation 49:606, 1974.
5. Friesinger GC, Page EE, Ross RS: Prognostic significance of coronary arteriography. Trans Assoc Am Physicians 83:78, 1970.
6. Bruschke AVG, Proudfit WL, Sones FM Jr: Progress study of 590 consecutive nonsurgical cases followed 5-9 years. 1. Arteriographic correlations. Circulation 47:1147, 1973.
7. Webster JS, Moberg C, Rincon G: Natural history of severe proximal coronary artery disease as documented by coronary cineangiography. Am J Cardiol 33:195, 1974.
8. Selden R, Neill WA, Ritzman LW, Okies JE, Anderson RP: Medical versus surgical therapy for acute coronary insufficiency. A randomized study. N Engl J Med 293:1229, 1975.
9. Mathur VS, Guinn GA, Anastassiades LC, Chahine RA, Korompai FL, Montero AC and Luchi RJ: Surgical treatment for stable angina pectoris. Prospective randomized study. N Engl J Med 292:709, 1975.

Children's Health Center
Pediatric Grand Rounds

CME-approved—2525 Chicago Avenue, Minneapolis, 12 noon:

May 17: Identification and Toxicology of Poisonous Plants in Minnesota—Dr. Herbert Jonas.
May 24: Adolescent Suicide—Dynamics and Management—Frankie Mae Paulson, Psychologist; Charles Van der Heide, M.D.; Marvin Ack, Ph.D.
May 31: The Wheeszing Infant—Dr. Jerry Neuwirth.

Rational Management of Hypertension

An Essay on Reason

JAMES C. DAHL, M.D.*

Patient and physician compliance is crucial to successful long-term management of systemic hypertension. A program of physician and patient education was initiated involving rural and urban medical centers. Patient compliance significantly improved by utilization of nurses as physician extenders to monitor and reinforce the principles set forth in a patient education program, as well as by direct involvement with patient follow-up under the direction of the patient's physician.

HYPERTENSION IS ONE of the easiest clinical problems to diagnose and treat, yet population studies have shown an amazingly low percentage of patients with this chronic problem who are adequately controlled. Ten to 15% of the adult population in this country are affected, and this figure is significantly higher in the black population and our older citizens. Thus, there are greater than 20,000,000 adults with the problem of hypertension today. The cause of hypertension is unknown. However, when the final chapters are written on this subject, it is likely that many pathologic conditions will be manifested by an elevated systemic blood pressure. One should not get hung up because we do not understand all the basic etiologic factors that produce the syndrome of essential hypertension. It is the *elevated pressure itself,* both systolic and diastolic, that produces the vascular damage which ultimately leads to its complications. Clinical trials and experimental evidence have proven this point conclusively.[1-3] To understand that hypertension is a potent risk factor in the development of vascular complications, one needs only to review actuarial tables of life insurance companies which have warned us for years that even modest elevations of blood pressure carry higher than average risks.[4] Figure 1 clearly detects a linear relationship between the morbid risk and the height of blood pressure over a period of time. The Framingham Study,[5] an 18-year demographic study of the adult population of Framingham, Massachusetts, brings into focus more clearly the effects of systemic hypertension as a risk factor for cardiovascular complications. To quote Dr. William Kannel, its project director, "Of all the risk factors considered, hypertension emerges as the most common, most potent, and universal contributor to cardiovascular mortality. Elevated pressure, casual or basal, labile or fixed, systolic or diastolic, at any age in either sex is a potent contributor to all forms of cardiovascular disease."[5] Figure 1 portrays the above facts and those sophisticated statistical analyses as needed to confirm the relationship of high mortality and the morbidity associated with elevated blood

HYPERTENSION PROJECT REVIEW—DATA SUMMARY
COMPOSITE

Total patients = 257
Total visits = 979 % of missed visits ≃10.21%
Missed visits = 100 Compliance ≃89.79%
Dropouts 9
Age Distribution:
Range: 24-87
Majority between 40 and 60 years
Blood Pressure Trend:

Up	Down	Stable	Unstable	Unknown
32	84	98	2	39

70.82%

Reasons for Missed Visits:
1) Recent appointment with physician
2) Hospitalization
3) Weather and transportation problems
4) Travel
5) Patient is unconcerned and related excuses

Figure 1

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pressure.

From the above statements, one would expect that the bulk of the hypertensive population is being well handled because of the frequency of the problem and the ease of diagnosis. The unfortunate facts are, however, that only a fraction of the patients with significant blood pressure elevations are well controlled. National Heart and Lung Institute statistics show now that 71% of the projected hypertensive population are aware of their problem, whereas a figure of 51% was recorded five years ago. Of this group, 29% are now on effective management, whereas the figure was 16% five years ago. Thus it is clear that someone is not getting the message. It is shown that hypertension is common, that it is a lifelong problem, and that a large percentage of the patients with this malady are managed very simply.

For some answers it may be well to check with the patient. It was Sir William Osler who stated that if you listen carefully to the patient he will tell you what is wrong. The National Heart and Lung Institute, by enlisting the aid of Lou Harris and Associates,[6] did some sampling of the population in general as compared to that population known to have blood pressure elevations. Some interesting data emerged. Most of the people surveyed could not define high blood pressure. Furthermore, those who knew they were affected by elevated blood pressure did not associate this elevation with heart failure, coronary artery disease, or kidney disease, but they did associate an elevated blood pressure with an increased incidence of stroke. Seventy-seven percent of subjects surveyed had their blood pressure taken within the previous year, but for some reason, only 61% were told the results. Another startling figure was that 23% of patients with known high blood pressure were not on therapy and, of those who were on therapy, 75% perceived that their physician planned ultimately to stop therapy. Another statistic to be considered is that 80% of the people look to their physician or clinic for health care information. Thus, in the area of hypertension, it seems probable that a good bit of misinformation exists in the minds of our patients relative to the definition, morbid effects, risks, and the need for long-term therapy. The answer seems obvious—patient education. Does patient education by itself improve compliance? If you define the term patient education by dissemination of information, the answer is no. Sackett and Gibson et al.[7] compared two groups of hypertensives. One group was exposed to a mastery learning program about hypertension. This program was a home program of literature defining the problem, its risks and morbid effects. Such an approach did not affect either compliance or the effectiveness of control of blood pressure. This group of workers was compared with a similar group of fellow employees who were not exposed to the learning program, and there was no statistical difference in either the results or in compliance. Inui[8] found that when information is coupled with motivation, indeed, education does improve compliance. Experience has taught that patients will comply if the following conditions are met: (1) the belief that treatment is necessary, (2) a trusting relationship in those who are treating them, and (3) outside support and encouragement to remain on treatment.

What are the attitudes about hypertension common to physicians? Freis[9] refers to hypertension as a challenge in preventive medicine. Unfortunately, the majority of our training has been directed to crisis intervention. A diagnosis of pneumonia is made, and antibiotics are given which result in a cure. Certainly any surgical emergency fits this picture of diagnosis, fix, and cure. Thus, our basic training has included little consideration of preventive medicine. Secondly, traditional medical opinion in the past did not accept that moderate elevation of blood pressure per se was a cause of the cardiovascular damage seen in hypertension. This traditional belief has been refuted by definitive experimental and clinical evidence, both in animals and in controlled clinical trials. Concern also has been overemphasized regarding the side effects of antihypertensive drugs. Thus, therapeutic nihilism has characterized the medical approach to benign hypertension. Many patients are told nothing following an examination or left with an admonition of "take it easy." Thus, physician education is a must. In a comparative study of physicians in a general medical clinic tutorial instruction in hypertension, Williamson[10] has shown that patient compliance and effectiveness of treatment improved. The physician tutorials were remarkably effective in changing physicians' behavior.

Further, the study suggests that a personal physician, if he is provided with the strategies for identifying the noncompliant patient, and intervenes in that behavior, can apply the stimulus to his patient that results in improved compliance.

Realizing the need to improve both patient and physician education, a protocol for care of the hypertensive patient was designed at the St. Louis Park Medical Center with the aid of a grant from the Northlands Regional Medical Program. In 1974, a pilot study was begun to evaluate the effect of patient and physician education on compliance in the setting of the patient's usual medical environment. The concept was tested involving rural and urban populations, and individual physicians in small as well as large multispecialty clinics. The clinics involved were those at Hutchinson, Minnesota; St. Croix Falls, Wisconsin; Wadena, Minnesota; Montevideo, Minnesota, and the Internal Medicine Department of the St. Louis Park Medical Center, Minneapolis, Minnesota. Screening was a constant process and all patients in the centers mentioned had blood pressures checked regardless of the reason for entry into the medical system.

Following the discovery of a fixed blood pressure elevation of 160/95 or more, patients were referred by the nurse to their primary physician, who evaluated the patient for secondary causes of hypertension and instituted medical management. Following this clinical evaluation and institution of therapy, the patient was encouraged to participate in three hours of classes that dealt primarily with his or her understanding of hypertension and its risks, and stressing the gains of compliance to reduce the risks of complications. Therapy, its effect and side effects were discussed at length and considerable time was spent in dealing with other risk factors such as diet, smoking and exercise.

As previously noted, information without reinforcement does not change behavior or affect compliance. The experience in the coronary care unit has taught us a valuable lesson in the use of the nurse as a physician extender. The role of the nurse in our program is central as he or she assumes the role of educator, advisor, and coordinator of the patient's long-term treatment program. It is the trained nurse in hypertension who will reinforce the point made in classes and follow through by bringing the suggestions of the patients to the attention of the primary physician. If she feels that more time and class work is necessary, arrangements for further individual instructions are made. Of equal importance is the monitoring of the patient's blood pressure. Medications and adjustments of therapy are made after consultation with the patient's primary physician. The role of the nurse is diagrammed in Figure 2. The nurse acting as the physician's extender adds significant support to the patient's wishes for a basic treatment schedule. Patients, as previously noted, will not remain on therapy unless properly motivated. A well-trained nurse is often better able to motivate a patient than the average physician. A clinical trial of hypertensive patients receiving care in a physician-manned medical clinic and a nurse-manned clinic at Walter Reed Hospital[11] showed that significantly better blood pressure control and better patient knowledge of his disease was found in the clinic manned by nurses. As Finnerty[12] pointed out, the basic training of a nurse is ideally suited to the supportive needs of the hypertensive patient.

During the initial 18 months of our study, 257 patients were entered in the program, and 979 visits were recorded. An overall compliance rate of 89.8% was achieved; 70.8% of the blood pressure readings were stable or reduced and

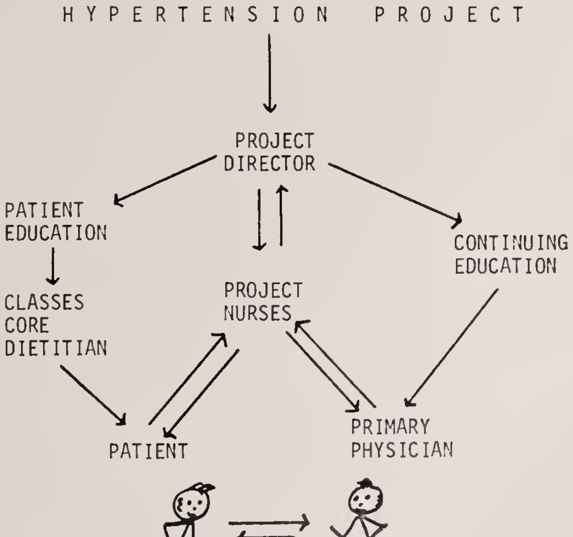

Figure 2

remained in satisfactory ranges. Freis[13] feels that 95% of the hypertensive population can be brought under excellent control. We did not achieve this goal, however; the figures in this selected group were well above the national averages. With the extension and expansion of our program, a larger sample will give more meaningful values. Likewise, the longitudinal nature of the program will result in morbidity and mortality data which is the logical end point to be sought. The successful implementation, however, primarily depends on the interest and enthusiasm of the person selected and trained as the physician extender. He or she should have the qualities of being sensitive to patients' needs and be able to relate well to both patients and physicians. It is the extender who is central to the program's success. Currently more than 800 patients are enrolled in our program and we are in complete agreement with the admonition put forth by Finnerty:[14] "The answer to hypertension is 'treating it and *keeping* it treated'."

References

1. Goldberg LL: Current therapy of hypertension, a pharmacologic approach. Amer J Med 58:469, 1974.
2. Roberts WC: The hypertensive diseases—evidence that systemic hypertension is a greater risk factor to the development of other cardiovascular disease than previously suspected. Amer J Med 59:523, 1975.
3. Finnerty FA Jr: The hypertensive problem, what can we do about it. Circulation 48:681, 1973.
4. Corliss GL: Recent intercompany mortality experience in treating hypertensives. Assn Life Ins Med Directors of America 58:90, 1974.
5. Kannel WB: Role of blood pressure in cardiovascular disease: the Framingham study. Angiology 26:1, 1975.
6. Louis Harris and Associates: The public and high blood pressure. DHEW Publication No. (NIH) 75-356.
7. Sackett DL, Gibson ES, Taylor DW, Haynes RB, Hackett BC, Roberts RS, Johnson AL: Randomized clinical trials of strategies for improving medication compliance in primary hypertension. Lancet 7918:1205, 1975.
8. Inui TS: Effects of postgraduate physician education on the management and outcome of patients with hypertension. Thesis. The Johns Hopkins University, 1973.
9. Freis ED: Changing attitudes to hypertension. Ann Int Med 78:141, 1973.
10. Williamson JW, Aronovitch S, Jimenson L, Ramirez C and Kelly D: Health accounting: an outcome-based system of quality assurance. Illus Application to Hypertension. Bull NY Acad Med 51:727, 1975.
11. Kennedy EJ: Managing the hypertensive patient: report of a study. Military Med 140:795, 1975.
12. Finnerty FA Jr: The nurses' role in treating hypertension. N Engl J Med 293:93, 1975.
13. Freis ED: Hypertension: challenge in preventive medicine. Prev Med 2:7, 1973.
14. Finnerty FA Jr: Drug Therapy 4, 1974.

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Beclomethasone Diproprionate Aerosol in Treatment of Corticosteroid-Dependent Asthma

WILLIAM F. SCHOENWETTER, M.D.*

Beclomethasone diproprionate was inhaled by 30 patients with severe corticosteroid-dependent asthma. This corticosteroid exerts a topical effect in doses that produce so little systemic absorption as to be without corticoid side effects or suppression of pituitary-adrenal function. Twelve of the 30 patients (40%) were completely withdrawn from systemic corticosteroids, and the dose was reduced at least 50% in 16 of the other patients (53%). Symptoms of relative adrenal insufficiency, malaise, arthralgia, and nasal stuffiness occurred in eight patients during the withdrawal of their oral corticosteroids, suggesting that the aerosol acted topically and not systemically. Oropharyngeal candidiasis which developed in two patients responded to antifungal mouthwash and did not require stopping the aerosol. Nebulized beclomethasone diproprionate is a very effective and safe new asthma drug.

TWENTY-FIVE YEARS AGO, at the time the St. Louis Park Medical Center was founded, corticosteroids were introduced into clinical practice and applied to the management of allergic diseases. Systemic corticosteroids have proven to be eminently successful in the management of severe asthma, but unfortunately significant and sometimes serious side effects have accompanied their use. During the past 25 years a number of attempts have been made to administer steroids by aerosol to the bronchial airways without producing systemic absorption. Aerosolization of Prednisone and later Dexamethasone produced a therapeutic effect in asthma patients but invariably was associated with the development or persistence of hypercorticism.[1,2] These drugs, therefore, offered no advantage over oral corticosteroids.

In 1971 British investigators began using a new nebulized corticosteroid, beclomethasone diproprionate, with high topical and low systemic activity. When inhaled in therapeutic doses, it had a direct anti-inflammatory action on the bronchial mucosa. Small amounts that may be absorbed are rapidly metabolized and do not exert significant systemic effects nor suppression of the pituitary adrenal axis.[3-5] Numerous clinical trials in England demonstrated the effectiveness of beclomethasone diproprionate in managing severe asthma.[4,6-8] In July 1975, physicians in the Allergy Department of the St. Louis Park Medical Center decided to send some of our severe asthma patients to England, Germany, Mexico, or Canada to obtain this drug through legal channels. We wished to gain experience with the drug and did not believe that our patients should be denied the benefits of the drug because of FDA inaction. This report summarizes our experience with beclomethasone diproprionate in our first 30 patients.

Methods

Patients selected for study met the following criteria:

1. They had severe chronic corticosteroid-dependent asthma which either was not well controlled, or they were experiencing significant side effects from steroids such as diabetes mellitus or poorly controlled hypertension.

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2. We enjoyed a good relationship with these patients and thought it likely that they would cooperate well in the study.

Thirty patients ranging in age from seven to 77 years with a mean age of 50 were studied. Asthma had been present from three years to as long as 50 years with a mean duration of 18 years. All patients were observed for a minimum of six months and some for a year. In the majority of these patients, no cause for their asthma could be found (Table 1). Five patients had asthma associated with aspirin sensitivity and recurrent nasal polyps. One patient was judged to have allergic asthma. All of the patients continued their usual non-steroid bronchodilator drugs. Three patients receiving Disodium Cromoglycate were included in the study and continued to use that drug. Nebulized beclomethasone diproprionate was inhaled four times daily from a metered-dose aerosol which delivers 50 micrograms of drug with each depression of the valve. The usual dose was two inhalations (100 micrograms) four times daily. The majority of the patients were seen monthly although a few from out-state were seen at less frequent intervals. During the period of observation, the maintenance dose of systemic corticosteroids was slowly reduced providing there was no worsening of the asthma. The reduction of the systemic corticosteroid dosage did not exceed 2.5 mg Prednisone per week or its equivalent. If there was an exacerbation of symptoms of asthma following reduction of oral corticosteroids, that dosage was increased. During each visit the patients were interviewed for severity of symptoms of asthma, the effects of corticosteroid withdrawal, the occurrence of respiratory infection and potential side effects from the administered aerosol. Auscultation of the chest was performed and the oral cavity was examined for evidence of oral-pharyngeal candidiasis. During most visits the forced vital capacity and the forced expiratory volume in the first second were determined using a Jones Pulmonor.

Results

All treated patients reported improvement in their asthma. Hospitalizations required for treatment of asthma decreased remarkably. In all patients, vital capacities remained stable or improved. We thought an objective way of measuring the effect of nebulized corticosteroid was to observe the changes in oral Prednisone requirements during the study. For the purpose of analyzing results patients were grouped according to the average daily rate of oral Prednisone requirement before beclomethasone treatment.

Group I	5-9 mg daily
Group II	10-15 mg daily
Group III	>15 mg daily

TABLE 1
Type of Asthma

	Number of Patients
Allergic	1
Non-allergic	21
Mixed	3
Associated with aspirin sensitivity	5

The results can be seen in Table 2. In Group I, comprising nine patients on less than 20 mg Prednisone every other day, five were able to stop oral Prednisone, three had reduced by one-half, and one was unable to reduce by one-half.

TABLE 2
Before and After Beclomethasone Diproprionate Nebulizer

BEFORE		AFTER		
		Reduction of Steroid		
Number of Patients	Prednisone Daily Dose	Complete	At Least Half	Less than Half
9	5- 9 mg	5	3	1
16	10-15 mg	6	9	1
5	>15 mg	1	4	0

Note: All of the patients in Group I, the majority in Group II, and two patients in Group III were taking prednisone on alternating days so that in each instance the dose was averaged to arrive at a daily rate.

Among 16 patients in Group II who previously were taking 10 or 15 mg daily or up to 30 mg every other day, six were able to stop oral Prednisone completely and nine were able to reduce by one-half.

Among five patients in Group III, those requiring the largest dose of corticosteroid, one patient was able to discontinue Prednisone completely and four others reduced by one-half.

The most common complications (Table 3) were due to withdrawal of systemic corticosteroids. Myalgia or fatigue persisted for several months in six patients. Two patients developed rhinitis symptoms and two developed nasal polyps. Patients who developed nasal polyps were among those who had discontinued oral corticosteroids. Oropharyngeal thrush symptoms occurred in two of the 30 patients. These symptoms responded to Nystatin® gargles, and the patients were able to continue the uninterrupted use of the nebulizer. One patient developed persistent hoarseness. Laryngoscopy demonstrated edema of the vocal cords. Another patient described an intermittent taste disturbance which alternated with complaints of a dry mouth.

TABLE 3
Complications

	Number of Patients
Myalgia/fatigue	6
Rhinitis/polyps	4
Thrush	2
Husky voice	1
Taste disturbance	1

Case Study

A 16-year-old boy with severe lifelong idiopathic asthma presented for continuing care in July 1975. He was then on a dose of Prednisone 50 mg every other morning and full dose oral bronchodilators. His 52" height was thought to reflect growth suppression from continuous corticosteroids. He had spent the previous year at National Jewish Hospital, Denver, a residential hospital for severe asthmatic patients and missed considerable school time. Once a month he required a week of daily Prednisone, in a burst, as his asthma exacerbated. In August 1975 he traveled with his parents to Canada to obtain beclomethasone. He began inhaling beclomethasone diproprionate at a rate of two inhalations (50 micrograms/inhalation) four times daily (400 mcg/day) and within several days experienced lessened asthma symptoms. The dose of oral Prednisone was slowly reduced at a rate of 2.5 mg every two weeks. When a dose of Prednisone 30 mg every other morning was reached, asthma became slightly more troublesome and his dose of nebulized beclomethasone was then increased to three inhalations four times daily (600 mcg/day). Asthma was better controlled and subsequently Prednisone was decreased to 20 mg every other morning The Cushingoid character of his face disappeared and, more importantly, his height increased three inches during the year. He was able to attend a regular school and missed only eight days of classes.

Discussion

In the present study which involved 30 severe asthmatic patients, complete withdrawal of systemic corticosteroid therapy was accomplished in 12 patients (40%). An additional observation was the reduction in the average daily systemic corticosteroid dose to less than one-half the average prior dosage in an additional 16 patients (53%). Thus, most steroid-dependent asthmatic patients could substantially reduce or eliminate the need for orally administered steroids. A striking result was the disappearance of the signs of hypercorticism coincident with improvement of asthma, which suggested that the steroid indeed acted locally with little if any systemic absorption. The appearance of rhinitis symptoms and nasal polyps during steroid withdrawal is further evidence that systemic absorption was not significant.

Numerous investigators have studied the effect of long term beclomethasone diproprionate administration on the hypothalmic-pituitary-adrenal axis after substitution for oral therapy with corticosteroids.[3-5] Almost complete recovery of adrenal function was observed in most patients within a period of six months. However, in patients whose hypothalmic-pituitary-adrenal axis was severely suppressed due to prolonged oral corticosteroid therapy, the rate of recovery was slow and incomplete at the end of a six month period. Such individuals may require systemic support with corticosteroid therapy when exposed to the prolonged stress of infection, surgery, or trauma.

We believe that therapy with nebulized beclomethasone diproprionate is indicated in the presence of corticosteroid-dependent asthma or asthma symptoms poorly controlled with full dose oral bronchodilator therapy. It could be initiated in patients who fail to respond to a trial of Cromolyn Sodium.

Contraindications to be considered when assessing asthmatics for treatment are untreated pulmonary tuberculosis or active treated tuberculosis, untreated pulmonary fungal or bacterial infections, and children under age six. To be effective, the inhaled beclomethasone must reach its site of action, and it cannot do so in the presence of severe bronchial airway obstruction. The presence of excess bronchial mucus also forms a barrier the aerosol cannot penetrate. Patients who are having acute asthma or severe chronic asthma with bronchial plugging first must be treated in the usual method with an adequate dose of systemic corticosteroid. The safety of this drug in pregnancy and allergic bronchopulmonary aspergillosis has not yet been established.

The emergence of allergic rhinitis and nasal polyps may be a major clinical problem in some patients. A short course of intranasal corticosteroids may be helpful for some of these patients. Most patients are so anxious to stop taking oral steroids that they are willing to endure these symptoms.

As is true with orally administered corticosteroids, the dose requirements of nebulized steroids vary at different times in individual patients so that the number of inhalations per day has to be adjusted periodically to the patient's symptoms. Although therapeutic activity is observed within three days, full effect may not be achieved until seven or 10 days, conforming to the usual lag characteristics of most steroids. For the same reason, dosage of the oral corticosteroid should be reduced slowly to avoid severe worsening of asthma. If an exacerbation of asthma, often precipitated by a viral respiratory infection, can be anticipated, then the dose of inhaled steroid can be increased before the onset of wheezing. Frequently in this situation severe airway obstruction does preclude delivery of the aerosolized drug into the lungs so that treatment with orally administered steroids may be necessary. Both patients in this study who required hospitalization had a viral respiratory infection, and we may have been too slow in responding with increased systemic corticosteroids to meet their increased requirement.

In 1976, five years after its introduction in England, the Food and Drug Administration allowed the sale of beclomethasone in the United States for the first time. Our results indicate that in patients with chronic steroid dependent bronchial asthma, treatment with nebulized beclomethasone diproprionate is effective.

References

1. Novey HS and Beall G: Aerosolized steroids and induced Cushing's Syndrome. Arch Intern Med 115:602, 1965.
2. Toogood JH and Lefcoe NM: Dexamethasone aerosol for the treatment of "steroid dependent" chronic bronchial asthma. J Allergy Clin Immunol 36:321, 1965.
3. Harris DM, Martin LE, Harrison C, et al.: The effect of oral and inhaled beclomethasone diproprionate on adrenal function. Clin Allergy: 3:243, 1973.
4. Maberly DJ, Gibson GJ and Butler AG: Recovery of adrenal function after substitution of beclomethasone diproprionate for oral corticosteroids. Br J Med 1:778, 1973.
5. Spitzer SS, Kaufman H, Koplivitz A, et al.: Beclomethasone diproprionate and chronic asthma: the effect of long-term aerosol administration on the hypothalmic-pituitary-adrenal axis. Chest 70:38, 1976.
6. Brown HM, Storey G and George WHS: Beclomethasone diproprionate: a new steroid aerosol for treatment of allergic asthma. Br J Med 1:588, 1972.
7. Clark TJH: Effect of beclomethasone diproprionate delivered by aerosol in patients with asthma. Lancet 1:1361, 1972.

MINNESOTA MEDICINE

The Board of Editors of Minnesota Medicine invites the members of the Minnesota State Medical Association to submit examples of their art work for publication on the cover of Minnesota Medicine. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of Minnesota Medicine, 101 East 5th St., Suite 900, St. Paul, Minnesota 55101.

Farrell Stiegler, M.D.
Cover Editor

Investigating Patients with Multiple Urinary Tract Infections

Are They Different?

CLYDE E. BLACKARD, M.D.*† and DAVID M. ANDERSON, M.D.*‡

During 1975, 2484 patients were treated at the St. Louis Park Medical Center (SLPMC) for urinary tract infection (UTI). Only 72 patients (3%) had a recurrent infection. Patients with a recurrent UTI were compared to a random sample of 33 patients with a single UTI to identify any differences between the two groups.

One of the most perplexing matters facing the urologist, or any physician for that matter, is the problem of recurrent urinary tract infections (UTIs). At any one time, an estimated 800,000 people in the United States have a UTI. UTIs probably do not cause a high incidence of renal insufficiency or death, but they are responsible for considerable morbidity, time lost from work, and medical expenses. Evans[1] estimated the cost of UTIs to be at least $20 billion annually.

This study was done to determine if recurrent UTIs were prevalent in our clinic practice, to define our present pattern of evaluation and treatment, and to gain information which would help us structure a prospective study of patients with recurrent infections.

Materials and Methods

A UTI, as defined in this study, is a bacterial infection involving the kidneys, ureters, or bladder occurring in males or females, and in adults or children. In some instances, the diagnosis of a UTI was based only on the presence of urinary symptoms or pyuria, and not strictly on the finding of bacteria in the urine. Significant bacteruria is defined in this study as the presence of 100,000 colonies or more of bacteria per milliliter of urine in a midstream "clean-catch" specimen from males or females, or as the presence of any bacteria in a catheterized specimen. A recurrent UTI is defined as an infection requiring three or more visits by a patient during the year of study, separated from the previous visit or series of visits by at least two weeks.

During the calendar year of 1975, 2484 patients were seen by physicians at the St. Louis Park Medical Center (SLMPC) for diagnosis of a UTI. Only 72 patients, or three percent, had a recurrent infection as previously defined. In a recent review of the literature, approximately 85 percent or less of patients initially treated for a UTI achieved bacteriologic cure. This meant that 15 percent or more demonstrated bacteruria on subsequent urine cultures or showed clinical evidence of a UTI usually within the first year or two after the initial treatment.[2] Relapse was much greater in patients with conditions predisposing to UTIs. Our low recurrence rate could be interpreted as effective initial treatment of UTIs, a shorter length of follow up, or a large percentage of patients consulting outside physicians whenever they had a recurrent infection.

Are there any significant differences between patients with a single UTI and those with recurrent UTIs? A retrospective chart review was made of the 72 patients with recurrent UTIs and a random sample of 33 patients with a single UTI seen during 1975 at SLPMC. The purpose of the review was to identify possible predisposing factors in those patients with recurrent infections, and to identify any differences in the evaluation and management of those two groups of patients.

Results and Discussion

Sex of Patients

During 1975, UTIs were more common in females than in males for all age groups com-

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See editorial, page 355.

bined (Table 1). Three times more females than males had a single UTI, whereas nine times as many females had recurrent infections. Most UTIs in women occur by the ascending route, whereby bacteria from the anus or vaginal introitus gain access to the bladder through the short urethra. The longer urethra and antibacterial properties of the prostatic secretion are thought to prevent ascending infections in males.

TABLE 1
Sex of Patients Treated for Urinary Tract Infections at SLPMC in 1975

Sex	One UTI	Rec. UTIs
Males	8	7
Females	25	65
TOTAL	33	72

Age of Patients

Three age group peaks in the incidence of UTIs were noted in our study; namely, the first, third and sixth decades (Figure 1). Single UTIs tended to occur in younger patients, whereas recurrent infections were more prevalent in the older age groups. The increased incidence of UTIs in pre-school girls, young, sexually active, and pregnant women, and aging women and men with prostatic disease may account for the higher percentage of infections in these three decades. Also, this may be due in part to an increased number of patients at SLPMC in those age groups.

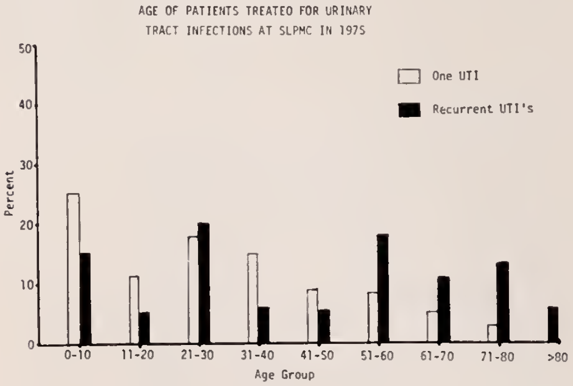

Figure 1

Past History of UTIs, Instrumentation, and Other Medical Illnesses

When the ages of our patients at the time of their first UTI were considered, three age group peaks were again noted; namely, the first, third, and sixth decades (Figure 2). Patients with recurrent UTIs did not start having infections at an earlier age when compared to patients with a single infection. For example, 46 percent of patients with recurrent UTIs were over 40 years of age when they had their first infection as compared to only 27 percent of patients with a single infection.

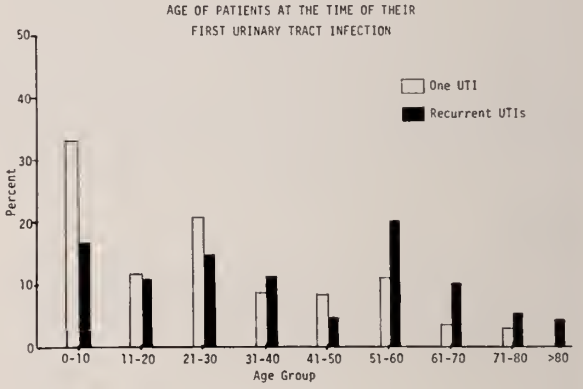

Figure 2

Patients with recurrent UTIs had a history of more numerous infections in the years preceding 1975 when compared to those having a single infection (Table 2). For example, only six percent of patients with a single UTI in 1975 had a past history of three or more UTIs as compared to 75 percent of patients with recurrent UTIs.

Six of the 33 patients with a single UTI (18 percent) and 57 of the 72 patients with recurrent infections (79 percent) had a past history of urinary tract instrumentation such as catheterization or cystoscopy, or a history of a foreign substance such as a calculus passing through their urinary tract prior to this study.

TABLE 2
Total Number of Urinary Tract Infections Per Patient Prior to 1975

Past UTIs	One UTI	Rec. UTIs
None	14	0
1	13	8
2	4	10
3	2	19
4-6	0	23
7-9	0	9
10-12	0	2
> 12	0	1
Total	33	72

Other significant medical diagnoses were more common in patients with recurrent UTIs. Only one of the 33 patients with a single infection had any serious medical problems, whereas in the 72 patients with recurrent UTIs there were 42 serious medical problems. These medical problems included strokes, cardiac disease, hypertension, diabetes mellitus, chronic obstructive pulmonary disease, arthritis, and thyroid disease. This probably reflected the older age group of patients with recurrent UTIs. Also, it is possible that serious medical problems in the older age groups prevented them from undergoing surgical correction of urologic lesions which in turn contributed to recurrent UTIs.

Evaluation of Patients

Nearly all patients treated for a UTI in 1975 had at least one urinalysis and one urine culture done. There were no features of the urinalysis which distinguished one group from another. Colony counts and sensitivities were obtained in most instances. Forty-two urine cultures were obtained in the 33 patients with a single UTI, and 294 cultures in the 72 patients with recurrent infections. Twenty-one of 42 cultures in presumably untreated patients with a single infection (50 percent), and 95 of 294 cultures in patients with recurrent infections (32 percent) showed no growth initially. This could be explained in part by the fact that some patients took an antimicrobial agent before submitting a urine specimen for culture, or that some patients had lower tract symptoms or pyuria in the absence of infection. Ten of 42 urine cultures in patients with a single infection (24 percent), and 116 of 294 cultures in patients with recurrent UTIs (40 percent) had greater than 100,000 colonies of bacteria per milliliter of urine.

Although patients with recurrent UTIs had multiple infecting organisms during 1975, the incidence of mixed infections per positive culture was the same in both groups (Table 3). For example, the 33 patients with a single UTI had 27 organisms isolated, whereas the 72 patients with recurrent UTIs had 265 organisms isolated. In both patients with a single UTI and those with recurrent UTIs, 1.3 organisms were isolated per positive culture.

Table 4 showed a tendency to perform more urologic tests and procedures in patients with recurrent UTIs. In patients with a single UTI, each patient had less than one test or procedure performed on the average, whereas each patient with recurrent UTIs had an average of more than two tests or procedures performed.

Urologic disease, other than what the patient was being treated for, was found more frequently in patients with recurrent UTIs (Table 5). The 33 patients with a single UTI had six additional urologic problems, as compared to 64 other urologic problems in the 72 patients with recurrent UTIs. The additional urologic problems are listed, and stress the importance of performing a complete urologic evaluation in patients with recurrent UTIs.

Treatment and Follow-up

Antimicrobial therapy was usually given when the urine culture grew 100,000 colonies or more per milliliter. Whether or not drugs were administered in accordance with sensitivity studies could not be determined from our data. Some patients were treated in spite of a negative cul-

TABLE 3
Bacteria Identified in Patients Treated
For Urinary Tract Infections at SLPMC in 1975

Organism	One UTI (33 Pts)	Rec. UTIs (72 Pts)
E. Coli	8	109
Enterococci	0	19
Proteus	0	17
Klebsiella-Enterobacter	1	15
Paracolon	2	12
Pseudomonas	1	5
Staphylococci	5	40
Miscellaneous Non-Pathogens	10	48
Total Isolated	27	265
(Total Positive)	(21)	(199)

TABLE 4
Tests and Procedures Performed in Patients
Treated for Urinary Tract Infections at SLPMC in 1975

Test or Procedure	One UTI (33 Pts)	Rec. UTIs (72 Pts)
Renal Function	3	31
IVP	9	55
Voiding Cystourethrogram	6	27
Cystoscopy	6	45
Cystometrogram	0	9
Total	24	167

TABLE 5
Other Urologic Diseases in Patients Treated
For Urinary Tract Infections at SLPMC in 1975

Other Urologic Diseases	One UTI	Rec. UTIs
Pyelonephritis	0	9
Renal calculi	0	1
Cystitis and/or urethritis	0	31
Vesicoureteral reflux	0	4
Bladder neoplasms	0	3
BPH	2	1
Prostatitis and/or prostatic calculi	2	1
Urethral stricture	0	7
Miscellaneous	2	7
Total	6	64

ture or without first obtaining a culture. Patients were usually treated for 10 to 14 days with an appropriate antimicrobial agent. The 33 patients with a single UTI received 20 antimicrobial agents, five of which were antibiotics, while the 72 patients with recurrent UTIs received 147 antimicrobial agents, 91 of which were antibiotics.

The 33 patients with a single UTI had eight follow-up cultures, whereas the 72 patients with recurrent infections had 94 follow-up cultures. This suggested a tendency to follow patients with recurrent UTIs more closely. Four of eight follow-up cultures (50 percent) in patients with a single UTI, and 53 of 94 follow-up cultures (56 percent) in patients with recurrent UTIs showed no growth. Patients with positive follow-up cultures usually received a second course of antimicrobial therapy.

Profile of the Patient with Recurrent Urinary Tract Infections

A profile of the patient with recurrent UTIs seen at SLPMC is shown in Table 6.

TABLE 6

Profile of the Patient with Recurrent Urinary Tract Infections Seen at the SLPMC

1. Female
2. Over 40 years of age
3. Past history of numerous UTIs
4. Past history of G-U instrumentation
5. Past history of foreign substance passing through the urinary tract
6. Other significant medical diseases
7. Multiple infecting organisms
8. Infecting organisms other than E. coli
9. Additional urologic problems
10. Multiple antimicrobials

What are some of the causes of recurrent UTIs? Inadequate treatment of a UTI could result in the persistence of an infecting organism. However, it has been reported that most recurrent UTIs are due to reinfection with a new organism. Often, there is a problem with the urinary tract which does not permit it to eliminate completely or destroy bacteria which gain access to it. For example, obstructive uropathy, cystocele, vesical or urethral diverticula, or neurovesical dysfunction may prevent the urinary tract from completely emptying urine and consequently, bacteria from it. Foreign bodies including calculi and neoplasms may make it difficult if not impossible to eradicate bacteria completely. Systemic or local impairment of renal, vesical or prostatic defense mechanisms, changes in the urothelium due to estrogen deficiency or inflammation, and chronic diseases such as diabetes mellitus may contribute to recurrent UTIs. All contributing factors must be considered, and this requires a complete urologic evaluation including at least a urine culture and sensitivities, voiding cystourethrography, intravenous urography, cystoscopy, and occasionally urodynamic studies. Adult males with more than one UTI and females with more than two UTIs should be investigated.

Often, patients with recurrent UTIs demonstrate no structural or functional abnormalities. It is possible that these patients have abnormalities so subtle, that current diagnostic procedures are not sophisticated enough to detect them. However, some recurrent UTIs may be related to perineal hygiene. Stamey[3] suggested that fecal organisms first colonize the female perineum and shortly thereafter ascend the urethra and cause a UTI in some patients. Why this occurs in some and not all women may be related to previously mentioned factors. Mayo and Hinman[4] demonstrated a high pressure zone in the mid-urethra which interferes with or stops the ascent of bacteria into the bladder. Colonization of bacteria above this mid-urethral high pressure zone allows them easy access to the bladder. Periodic, complete emptying of the bladder and urethra plus local urothelial defense mechanisms prevent colonization of bacteria.

Acknowledgment

The authors acknowledge the assistance of Doctor Paul Batalden of the Health Services Research Center in designing the chart review study..

References

1. Evans AT: Infections of the kidney and bladder in the adult. In Karafin L and Kendall AR: Urology, Harper & Row, p 1, 1976.
2. Kidney and Urinary Tract Infections. Published by the Lilly Research Laboratories, Indianapolis, p. 79, 1971.
3. Stamey TA: Urinary Infections, Williams and Wilkins, p 109, 1972.
4. Mayo ME and Hinman F: Role of mid-urethral high pressure zone in spontaneous bacterial ascent. J Urol 109:268, 1973.

Treatment of Acute Leukemia

1970-1976

ROBERT A. GREEN, M.D.*

In 1952 acute leukemia was a disease for which there was no effective treatment. Those of us who treated patients at that time with leukemia suffered the frustrations of dealing with a desperate devastating disease for which there was nothing positive to offer. The antileukemic chemicals were still not available, and in the published series of that time median survivals were reported to be in the range of one to two months.[1] The chemical 6-mercaptopurine produced a 7% remission rate in the early 1950s and methotrexate alone was no better.[2,3] There was little progress until the four-drug combination, VAMP (vincristine, amethopterine [methotrexate], 6-mercaptopurine, prednisone) was first given in the early 1960s, with a reported remission rate of 43%. The median duration of response in that series was 13½ weeks.[4] There was essentially no further improvement until later in the 1960s, when cytosine arabinoside and daunomycin became available and prospects for response and survival were strikingly improved. The best results by far have been achieved in the treatment of childhood acute lymphoblastic leukemia, but results in adults have also been encouraging.

SOME INVESTIGATORS IN large research institutes have claimed that acute leukemia should be treated only in such centers. If it is being treated in the private sector of medical practice, it is critical to evaluate these results. The results recorded are from the oncology section of the St. Louis Park Medical Center, and represent cases followed from 1970 to 1976. They have all been treated by my colleagues and me in community hospitals in Minneapolis. As such, they represent an experience in the private sector with several physicians participating, using a variety of treatment schedules and without adherence to a strict protocol.

Pathologic Types

A total of 82 cases of acute leukemia in adults was managed by us during that period of time (Table 1). Seventy-three of these were acute nonlymphocytic leukemia including 40 diagnosed pathologically as acute myelogenous leukemia, 24 as acute myelomonocytic leukemia, one each of acute promyelocytic leukemia, acute monocytic leukemia, and acute erythroleukemia. Six patients had blastic transformation of chronic myelogenous leukemia, and there were nine with acute lymphocytic leukemia.

TABLE 1
Adult Acute Leukemia SLPMC 1970-76
Distribution of cases According to Morphologic Type

		Number of Patients
Total		82
Acute nonlymphocytic leukemia (ANLL)		73
AML (40)	AMoL (1)	
AMML (24)	AEL (1)	
APL (1)	BC-CML (6)	
Acute lymphocytic (ALL)		9

Outcome

Sixty-six of the 82 have died, leaving 16 living patients whom we are currently following. Two of these have lymphocytic leukemia and the others have nonlymphocytic leukemia. Six of the latter are not included in this study because of too recent accession. This report concerns 60 cases of acute nonlymphocytic leukemia. Fifty-two of them were treated with chemotherapy and are the subject of this report.

Effect of Age

In this series males and females were almost equally represented. The age distribution indicates that the disease actually occurs more frequently in elderly than in young adults in contrast to what was once thought to be the case (Table 2). Among our patients, 75% were 50 years of age or older and more than half were over 60. There are a number of advocates of non-treatment of this older population, but age was not a contraindication to treatment in our group, except that no one 80 or over was treated for reasons which will be detailed later.

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TABLE 2
Age Distribution 60 Patients with
Acute Nonlymphocytic Leukemia (ANLL)
Analyzed in this Study

Age	Total Number of Patients	Number Treated
20-29	5	5
30-39	3 (1 early death)	2
40-49	6 (2 early deaths)	4
50-59	14	14
60-69	15	15
70-79	13	12
80-89	4	0

Laboratory Studies

The initial laboratory studies indicated that about 15% of the patients had severe anemia with hemoglobin less than 6 gm. White blood counts ranged from 450 to 200,000. We did not attempt to relate leukocyte levels to outcome. Ten percent were profoundly thrombopenic at the outset. Very high blast counts were found in the marrow in 30% of the patients and in about one-third of the patients Auer bodies, a diagnostic finding in the myeloid leukemias, were described (Table 3).

TABLE 3
Initial Laboratory Studies
60 Cases
Adult Acute Nonlymphocytic Leukemia

	Number of Patients		Number of Patients
Hemoglobin		Blasts Peripheral Blood	
0-5.9	9	0- 5	13
6-8.9	22	5-15	3
9 or over	29	15-35	11
		35-75	16
WBC		Over 75	12
0- 3,000	18		
3- 6,000	7	Blasts Marrow	
6-20,000	17	0- 5	1
Over 20,000	18	5-15	5
		15-35	8
Platelets (Range 450-200,000)		35-75	20
		Over 75	18
0- 20,000	6		
20- 50,000	17	Auer Bodies	
50-100,000	15	Blood	12
Over 100,000	11	Marrow	20

Drug Regimens

The therapeutic drug regimens used in these patients reflect changing times and enthusiasm for various schedules (Table 4). The earliest patient was treated with VAMP as a leftover from the mid-1960s experience. Cytosine arabinoside and daunomycin were still investigative drugs in the early 1970s. Daunomycin remains investigational, but supplies were obtained from the National Cancer Institute. Euthusiasm for cytosine arabinoside as one of the two best single agents for acute nonlymphocytic leukemia is reflected in its use in two major combinations, TG-Ara-C[5] and COAP (Cytoxan, Oncovin, Ara-C, prednisone) reported in 1969 and 1970,[6] and for daunomycin, in its use alone and in combination with Ara-C reported in 1968,[7] and in 1970,[8] respectively. The majority of the earlier patients in our series were treated with COAP or TG-Ara-C, but the last several patients both in this series and in others of our patients being treated at present, but who are not included in this report, have been treated with daunomycin-Ara-C in the belief that these two drugs in combination are the best currently available treatment for acute nonlymphocytic leukemia.

TABLE 4
Chemotherapeutic Regimens—60 Cases
Adult Acute Nonlymphocytic Leukemia

	Number of Patients
COAP (Cytoxan, Oncovin, Ara-C, Prednisone)	22
6TG-Ara-C (6 thioguanine, Cytosine Arabinoside (Ara-C) (Cytosar)	18
Daunomycin (Daunorubicin)-Ara-C	9
Daunomycin alone	2
VAMP (Vincristine, Amethopterin, 6-Mercaptopurine, Prednisone)	1
No treatment	8

Eight of the 60 patients were not treated for a variety of reasons (Table 5). Three died very early after admission and diagnosis, two of central nervous system hemorrhage due to coagulopathies and one with a very high white count with probable central nervous system complications of vascular leukostasis. (It is now well known that patients with very high white counts are at extreme risk of early death and represent treatment emergencies by prompt brain radiation, aggressive multiple drug chemotherapy and possibly by leukophoresis). Four octogenarians declined treatment and one woman in her late 70s died of her disease without treatment ever being given.

Blood and platelet transfusions were used liberally. Reverse isolation was ordered when leukocyte counts were less than 1,500/mm^2 but was not rigorously enforced. There were no facilities for laminar flow or similar protective devices and prophylactic oral antibiotics were not used.

TABLE 5
Details of Eight Untreated Cases ANLL

Sex	Age	Comment
Male	47	Sudden death due to CNS hemorrhage
Male	38	Sudden death due to CNS hemorrhage
Female	47	CNS and renal leukostasis—very high WBC
Male	81	Refused chemotherapy
Male	83	Refused chemotherapy
Male (MD)	84	Refused chemotherapy
Male	80	Refused chemotherapy
Female	78	Died 3 days after diagnosis without treatment

Results of Chemotherapy

The treatment of acute leukemia with the goal of remission is in some respects more of an ordeal today, through intensive chemotherapy, than it was 25 years ago when there was essentially no effective treatment. The ordeal is primarily that of a patient who goes through physical and emotional agonies that are indeed difficult for most of them to bear. This aspect of treatment is seldom discussed in the literature on the management of acute leukemia. Families are distressed by the diagnosis and by the rigors of treatment, and the physician and staff suffer for both patients and their families and for themselves by reason of the prospects of possible failure. I know of no situation in practice where the strain is so great, or the reward of response so gratifying. The burden of management of the patients in this series has been borne entirely by the physicians themselves without extensive house staff support but with the superb contributions of a highly skilled and motivated nursing staff in each of the hospitals.

The question is, how often can remission be achieved and in attempting to achieve it, what price is paid to endure the agony of treatment? We will look at our results and at the end compare them with those reported in the literature of the past eight years.

Fifty-two patients with acute nonlymphocytic leukemia treated during the past six years are the subject of this report. Twenty-six patients entered complete or partial remission of variable duration, and 26 failed to enter remission (Table 6). Basically, complete remission is defined by us to include only cases with post treatment marrow blast counts of less than 2% and the majority of these had 1% or less (22 patients). Partial remission includes patients with blast counts of 4-8% (four patients). These patients were all clinically free of signs and symptoms of leukemia.

TABLE 6
Analysis of Response to Treatment of
52 Treated Adult Patients with ANLL

All Cases Treated	Number of Patients
Complete remission (<2% blasts in marrow)	22
Partial remission (3-8% marrow blasts)	4
CR and PR	26
Failure to achieve remission	26
"Gross" PR and CR	50%
Excluding 6 incompletely treated cases (Death 3-13 days from diagnosis with inadequate course of chemotherapy)	57%
Excluding 2 cases of longstanding sideroblastic anemia with malignant transformation	59%

The overall response rate for all 52 patients in this series was 50%. Certain exclusions seem justified. For example, if six patients are excluded who died from three to 13 days after diagnosis and who had very abbreviated treatment, the response rate is increased to 57%. Two cases are also included in the totals above who had sideroblastic anemia for long periods of time before undergoing leukemic transformation and if these are excluded as differing significantly from acute nonlymphocytic leukemia generally, the response rate then becomes 59% for the series.

Analysis of the 26 patients who entered remission shows a median survival of 7.7 months for those who subsequently died (Table 7). For those who are still living, the average remission

TABLE 7
Survival/Remission in 26 Patients with ANLL
Who Achieved Remission 1970-1976

		Average Age
Patients who died — Median survival	7.7 months	54
Patients still living — Median remission	16 months	45

duration at the time of this report is 16 months with a follow-up of four months for the most recent patient to 29 months for the longest survivor. Three of these patients are currently ill and have relapsed, one after 14 months, one in his second relapse 22 months from initial diagnosis, and one who relapsed 15 months after diagnosis and failed to enter another remission, but is still alive five months after diagnosis of relapse. It appears that the longer remissions in this series are occurring in the younger age group, a fact of prognostic importance when discussing prospects for response with newly diagnosed patients.

We have tried to show, with admittedly somewhat inadequate numbers in each group, which chemotherapy regimen has been most effective in inducing remission and, if possible, which produces remissions of the longest duration (Table 8). Of those adequately treated, the response rate for COAP is 44%, for TG-Ara-C 56%, and for daunomycin-Ara-C 67%. Two of two patients on daunomycin alone entered complete remission, but conclusions cannot be drawn for this number. For the three larger groups, the duration of remission is the same.

TABLE 8
Analysis of Remissions 26 Cases ANLL by Therapeutic Regimen

Chemotherapeutic Regimen	Total Adequately Treated	CR and PR Number	%	Average Duration Remission (months)	Range (months)
COAP	18	8	44	9.5	1-32
6TG-Ara-C	16	9	56	8.7	1-29 (1 still in CR)
Daunomycin-Ara-C	9	6	67	8.5	4-13 (5 still in CR)
Daunomycin alone	2	2	(100)	9.5	3-16

What can be said about the failures? The question of age and response to treatment is the subject of controversy in the literature. How do they respond and should they be treated or not?[9,10] Among our patients, younger patients have a definite advantage in terms both of response and survival over older patients (Table 9). The number of failures to achieve remission shows a progressive rise with advancing age. There were no failures in seven patients under the age of 40 and one failure in patients between the ages of 40 and 50. Two-thirds of our patients in their 60s failed to achieve remission and results are even worse in the 70s in which 11 of 13 in our group failed to achieve remission.

TABLE 9
Analysis of 26 Treatment Failures ANLL by Age

Age	Number Patients Treated	Number Failures	% Failures in Age Group
20-29	5	0	0
30-39	2	0	0
40-49	4	1	25
50-59	14	6	43
60-69	15	10	67
70-79	12		

Looking at it the other way, all but one of the treated patients under age 40 achieved remission and a progressive declining percent achieved remission in the 50s, 60s and 70s (Table 10). With improved drug therapy both for induction and maintenance, and perhaps with more vigorous attempts at prophylaxis of infection in this older age group, better results can no doubt be achieved.

Price of Treatment

From the patient's point of view, no matter how arduous the trial, treatment almost always seems worthwhile to those who get the welcome news that they are in remission. Time in the hospital is sometimes unbelievably long and costly, both in suffering and dollars. Our patients who achieved remission, but who died during the years of this study, spent 42 days in the hospital on the average, 32 of them for their first induction remission. (Table 11).

TABLE 10
Analysis of 26 Remissions Adult ANLL by Age

Age	Number Patients Treated	Number CR and PR	% CR and PR By Age Group
20-29	5	5	100
30-39	2	2	100
40-49	4	3	75
50-59	14	8	57
60-69	15	5	33
70-79	12	3	25

For patients who are still living, an average two months of their life to date was spent in the hospital for leukemia-related problems, 39 days of them for the period of first induction.

TABLE 11
Days in Hospital—Treated Patients with ANLL

		Average Number Days in Hospital
Patients who have died		
	Total course	42.6 (range 9-88)
	1st induction	32.6 (range 12-69)
Patients still living		
	Total to date	61 (range 20-162)
	1st induction	39 (range 20-95)

Complications

During the long periods of stressful hospitalization, multiple complications can occur. One of the disastrous complications of leukemia treatment, with drug-induced leukopenia, is that of infection. Fifty-two of 60 patients had significant infectious episodes as defined by fevers of 101° or over (Table 12). When evaluating their fever, it is not always easy to decide what is disease and what is complicating infection. If temperatures reach 101° or higher, blood and urine cultures are routinely obtained and combination antibiotic therapy is started. More often than not, cultures have been a disappointment in defining an organism. In 38 patients, all cultures were negative, but in 52 patients in whom infections occurred, 13 had positive blood cultures and nine had a variety of positive cultures from other sources. The commonest septicemias were due to gram negative rods, primarily E. coli. Four had pseudomonas septicemia.

TABLE 12
Infectious Episodes
(t. 101 or higher)
60 Cases Adult ANLL

	Number of cases
Total	52
Positive cultures	22
All cultures negative	38
Positive blood cultures	13
gm. neg. rods	5
pseudomonas	4
coag. pos. staph.	4
Staph. abscess	4
Staph. pneumonia	1
Pseudomonas abscess (rectum)	1
Leg ulcer gm. neg. rod	1
UTI—gm. neg. rod	2

Many different antibiotic schedules were used, but in the majority combinations of Keflin and Gentamycin, with or without Carbenicillin, were given (Table 13).

TABLE 13
Infectious Episodes Antibiotic Regimes Used

	Number of Times Used
Keflin, carbenicillin, gentamycin	13
Keflin, gentamycin	12
Ampicillin	6
Oxacillin	6
Carbenicillin, gentamycin	5
Dicloxacillin	2
Cleocin, gentamycin	2

Comparison of SLPMC with National Results

Finally, we ask how our results compare to those published in series from different major institutions around the United States. It is critical to know whether acute leukemia can be treated well and safely in community hospitals.

The relatively short history of successful treatment of acute leukemia in adults began with the reports of VAMP therapy in 1965 (Table 14). In the first series, 43% of adult patients with acute leukemia achieved remissions with this combination with a median duration of three months. Following this, the remission rate in several series reported between 1968 and 1972 varied from 44 to 62%. Holland and Frei[11] in *Cancer Medicine*

TABLE 14
Remission Rates ANLL Reported in Literature
Compared to SLPMC Data

	Remission Rate (%)	Median Duration (months)
VAMP—1965 (Hall-Moloney et al)	43	3
Holland-Frei in Cancer Medicine		
Ara C-6 TG	36	4
COAP	50	
Daunomycin—Ara C	62	
Clarkson (Sloan-Kettering)		
Original Ara C-6 TG	52	19
L-6 Modification (Ara C- 6TG plus V, MTX, BCNU, Hydrea Daunomycin, 1-asparaginase	56	10
SLPMC	52	Dead 7.7 Living 13.0

list responses to TG-Ara-C as 36% with a median duration of four months. Somewhat better results are noted for COAP and daunomycin-Ara-C. Clarkson reported a 52% remission rate at Sloan-Kettering Institute for patients treated with TG-Ara-C and a 18-month median remission on maintenance.[5]

Our response rates for our group as a whole are in the same general range as those noted above. Results in the daunomycin-Ara-C group (67% CR and PR; 55% CR) suggest overall results for our patients will be even better in the future. Our median survivals, however, are somewhat disappointing and among other things likely reflect uncertainty on our part about aggressive maintenance therapy. That is by no means unique for us, because it remains to be shown what is adequate long term maintenance for adult acute nonlymphocytic leukemia.

Discussion

The reasons for doing studies such as this in private practice are many. It becomes apparent very quickly not only what has been done well, but points out more important what needs to be done to improve one's practice. It also serves as a device to compare what one can achieve in the private sector, social, personal and economic considerations notwithstanding, with what is achieved in institutional practice.* Our results also show that acute leukemia in adults can be treated safely in community hospitals by experienced physicians willing to assume the responsibility for these patients.

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*In a cooperative study with the Memorial Sloan-Kettering Cancer Center, Grann et al. showed quite clearly that acute leukemia in adults can be treated effectively in community hospitals.[12]

References

1. Gunz F and Hough RF: Acute leukemia over age 50; study of its incidence and natural history. Blood 11:882, 1956.
2. Boggs DL, Wintrope MM and Cartwright GE: Acute leukemia; analysis of 322 cases and review of literature. Medicine 41:163, 1962.
3. Huguley CM Jr, Vogler WR, Lea JW, Corley CC Jr and Lowrey NE: Acute leukemia treated with divided doses of Methotrexate. ASCH RNT Med 115:23, 1965.
4. Thompson I, Hall TC and Moloney WC: Combination therapy of adult acute myelogenous leukemia (experience with the simultaneous use of vincristine, amethopterin, 6-mercaptopurine and prednisone). NEJ Med 273-1302, 1965.
5. Gee TS, Yu KP and Clarkson VD: Treatment of adult leukemia with arabinosyl, cytosine and thioguanine. Cancer 23:1019, 1969.
6. Whitecar JP, Bodey GP, Freireich EJ, McCredie KB and Hart JS: Cyclophosphamide, vincristine, cytosine arabinoside, and prednisone (COAP) combination chemotherapy for acute leukemia in adults. Cancer Chemotherapy Reports, Part 1 56, #4:543, August 1972.
7. Buado F, et al.: Daunomycin-preliminary results of treatment of acute leukemia in adults. Oncology 22:67, 1968.
8. Crowther D, Bateman CJT, Vartan CP, Whitehouse JMA, Malpas JS, Fairley GH and Scott RB: Combination chemotherapy using L-Asparaginase, Daunorubicin, and cytosine arabinoside in adults with acute myelogenous leukemia. Brit Med J 4:513, 1970.
9. Crobsy WH: To treat or not to treat acute granulocytic leukemia. Arch Int Med 122:79, 1976.
10. Rosner F, Sawitsky A, Grunwald HW and Rai KR: Letter: Acute granulytic leukemia in the elderly. Arch Int Med 136:-120, 1976.
11. Holland H and Frei E: Cancer Medicine. Lea & Febiger, Philadelphia, p. 715.
12. Grann V, Erickson R, Flannery J, Frinch S and Clarkson P: The therapy of acute granulocytic leukemia in patients more than 50 years old. Ann Int Med 80:15, 1974.

Women Physicians' Meeting

The Annual Minnesota Meeting of the American Medical Women's Association will be held on Saturday, May 21, 1977 in the Radisson South Hotel, Bloomington. The luncheon meeting will begin at 12:00 noon, and there will be a featured speaker. All interested are encouraged to contact either of the following for further information about the organization and/or the Annual Meeting.

Frisca L. Van-Go, M.D.
Secretary
1151 Plummer Circle S.W.
Rochester, MN 55901

Audrey Nelson, M.D.
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Gallbladder Surgery

A Review

LEE A. SIMSO, M.D.*

A series of 349 consecutive operative procedures on the gallbladder is reviewed to evaluate the indications for surgery and the immediate postoperative morbidity and mortality in a private clinic setting.

FROM 1971 THROUGH 1974, a total of 397 gallbladder procedures were performed by members of the Department of Surgery of the St. Louis Park Medical Center. Surgical residents from the University of Minnesota assisted with the surgery. This study deals with the immediate operative and postoperative course of the patients. Postoperative care was provided by the same individuals except where consultation with another medical or surgical service was required. Postdischarge follow-up was also done by the department except in those cases where the patient was referred from outside the metropolitan area or outside the clinic.

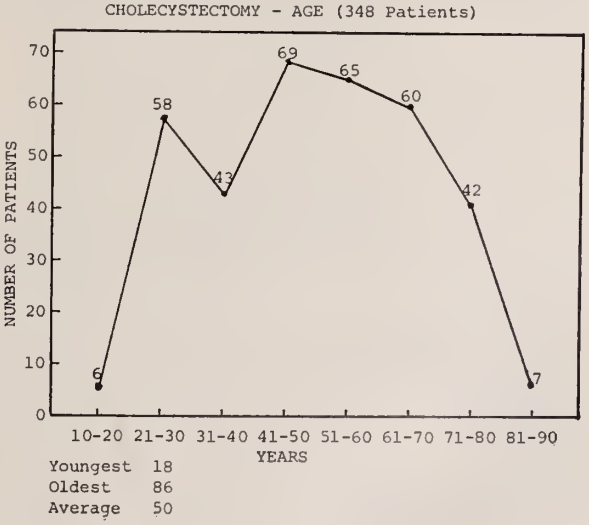
Materials and Methods

Both clinic and hospital charts were reviewed. Posthospital information was obtained on 90% of the patients by reviewing subsequent admissions to Methodist Hospital as well as subsequent clinic visits. No effort, however, was made to contact these patients personally or to follow-up those patients who had not subsequently been seen at the clinic or at Methodist Hospital.

The 397 gallbladder procedures included two cholecystostomies, 347 cholecystectomies, and 48 cholecystectomies with common bile duct exploration. The 48 patients who had common bile duct explorations *were not included in this study.* Consequently, this study involves a total of 348 patients who underwent 349 procedures. One patient underwent both a cholecystostomy and a subsequent cholecystectomy.

Two hundred seventy-two or 70% of the procedures were cholecystectomies alone. Cholecystectomies combined with incidental appendectomy totaled 34 or 10%, and a second operative procedure was performed in an additional 41 or 12% of the patients.

It is of some interest that in the group of incidental appendectomies, there were three patients who were noted on pathological examination to have acute appendicitis. These patients had been admitted to the hospital with abdominal pain which had been diagnosed as cholelithiasis or cholecystitis and the true nature of their acute admitting complaint was only noted on pathological evaluation of the appendix. These patients also had cholelithiasis.



Youngest 18
Oldest 86
Average 50

Figure 1

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A previous review of our experience with gallbladder surgery had been done by Dr. Robert B. Benjamin[1] of this department in 1958; very little change was noted in the type of patients submitted to surgery over the period of time reported here. Sixty-seven percent of the patients were female. Thirty-seven percent of the patients were considered at the time of surgery to have another current major medical illness which could potentially compromise their surgical prognosis. The age range of the patients (Figure 1) demonstrates a rather substantial homogeneity of numbers of patients between the third and the eighth decade. The average age was 50, the youngest patient age 18, and the oldest patient age 86. Ninety-five percent of the patients had calculus gallbladder disease and 5% acalculus cholecystitis. The family history was positive for gallbladder disease in 26% of those in which the family history was documented. One would suspect that a more accurate family history would demonstrate a higher incidence of gallbladder disease since upwards of 30% of adults as they reach 60 to 70 years of age are reported to suffer from this problem. Forty-three percent of the patients were described as being obese or overweight, 48% were normal, and 9% were described as thin.

The indications for surgery are listed on Figure 2. The most common indication was gallbladder colic, by which is meant acute attacks of right upper quadrant pain often associated with nausea and vomiting, lasting for minutes to hours, and then disappearing spontaneously without residual. These attacks are frequently recurrent and are characteristic symptoms of gallbladder disease.

Cholecystectomy
Indications for Surgery

Colic	107
Dyspepsia	82
"Pain"	56
Acute Cholecystitis	50
History of Cholecystitis	25
Jaundice	17
Asymptomatic	14
Pancreatitis	5
Mass	5
Incidental	4
Hepatic Dysfunction	3
Exploratory Laparotomy	2

Figure 2

The second most common indication for surgery was dyspepsia by which is meant a more vague symptom complex including fatty food intolerance, indigestion, bloating, and gas. These symptoms are generally thought to be associated with gallbladder disease but unfortunately can be associated with many other disease processes. It is the department's policy to discuss this quite frankly with the patients prior to surgery, and point out to them that their symptoms may not be related to gallbladder disease and consequently may not be relieved by surgery. An extra effort is also made in the workup to preclude other medical or surgical problems in this group of patients.

The third indication was pain, which might be included under the dyspepsia category; but was a more constant epigastric or right upper quadrant pain, of a more chronic nature than colic, and not severe enough to be categorized as acute cholecystitis. The remainder of the indications are fairly self-explanatory and total more than 349, since in several patients there was more than one immediate indication given for surgery.

Of special interest is the group of asymptomatic or silent gallstone patients which in this series numbered only 14 cases, or less than 5%. It would seem that our referring physicians are rather conservative in their indications for gallbladder surgery, since it is the policy of the department to recommend surgery for patients with silent gallstones if they are reasonable surgery risks.

Results

The surgical procedure used at the clinic is fairly standard and generally utilizes a right upper quadrant Kocher incision. The rectus muscle is transected or retracted depending on the anatomical situation. If possible the common duct, cystic duct, and cystic artery are dissected and controlled prior to removing the gallbladder in a retrograde manner. Electrocautery is used liberally for hemastasis and the gallbladder bed is closed at the discretion of the operating surgeon, some preferring to close it and some not. Abdominal closure usually utilizes a running synthetic soluble suture in the peritoneum and posterior rectus fascia, interrupted Dacron sutures in the several fascia layers, and interrupted silk sutures in the skin. Most of the surgeons in the department do not use subcutaneous closure, and there is an increasing tendency to irrigate the wound with antibiotic solution or to instill powdered Ampicillin at closure.

Operative cholangiograms were not done routinely during this period of time, and only 24% of the patients in this group did have an operative cholangiogram. Nevertheless, we do not have a documented case in this series of 348 patients in which a patient was subsequently diagnosed as having common duct stones. There was at least one individual, however, who was admitted with an episode of what clinically appeared to be a cholangitis which cleared spontaneously, and a subsequent intravenous cholangiogram was normal. One would suspect that he passed a small residual common duct stone.

A culture of the gallbladder bile was obtained in 73% of the patients and 23% of those cultured were positive. This is a somewhat smaller percentage than that generally indicated in the literature and probably reflects a somewhat earlier stage of the disease in the patients in this series.

The culture results are shown in Figure 3 and are not very different from that which would be expected. Clostridium species were identified in two cultures, one of which was perfringens. These were not associated with any postoperative problems.

Culture Results (58 patients)

Gram Positive	
Alpha Strep	**12**
Staphylococcus	**12**
Cocci Not Specified	**4**
Bacilli Not Specified	**2**
Clostridium Species	**2**
Diphtheroids	**2**
Strep. Fecalis	**1**
Enterococcus	**1**
Gram Negative	
Bacilli Not Specified	**14**
E. coli	**8**
Klebsiella	**6**
Enterobacter	**2**
Yeast	**1**

Figure 3

Antibiotics are not used routinely, and in 69% of the patients no antibiotics were given. The use of antibiotics was generally dependent on the results of the immediate Gram smear of the bile. Where the smear or culture was positive, 67% of the patients did receive antibiotics and only 12% of those who were not cultured were treated with antibiotics.

During the period of this study, 55% of the patients did not have any type of drainage utilized. Of the remainder who were drained, the vast majority had only one penrose drain. This seemed to have no adverse effect on the surgical morbidity.

The real interest in this study is what happens to the patients postoperatively; what is the morbidity and mortality of this procedure? Figure 4 shows the day of discharge of the patients postoperatively. The average patient was discharged at 6.4 days postoperatively, and well over 50% of the patients were discharged in five days or less. Eighty-five percent of the patients were discharged within one week of surgery. These figures compare very favorably with what is generally quoted in the literature. In a study recently published from Scotland by Bremner,[2] their average hospital stay was 10 days postoperatively and it was two weeks before 80% of the patients were out of the hospital.

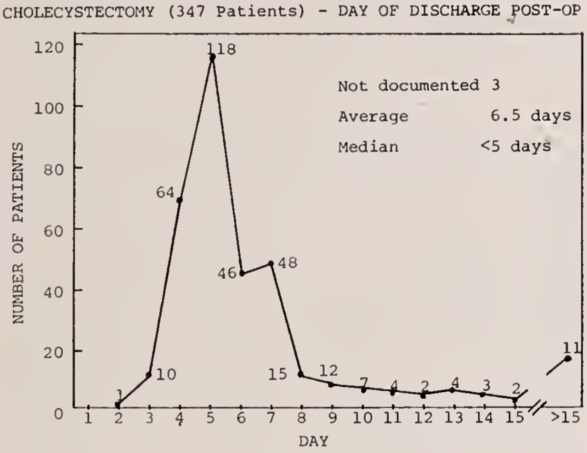

Figure 4

Complications occurred in 67 of our patients, or 19% (Figure 5). These 67 patients had a total of 95 complications which are listed in Figure 6. As can be seen, over half of the complications are relatively minor and produce no long-term morbidity. The urinary tract infections, for instance, included several totally asymptomatic patients diagnosed on the basis of a urine culture.

The ileus category includes patients who were delayed in tolerating oral intake, or who required a nasogastric tube. There was one pulmonary embolus and one diagnosed case of thrombophlebitis in this series. There were five wound infections documented for an infection rate of 1.4% and three deaths for a rate of 0.86%.

Cholecystectomy (349 patients)

	Number of Patients	Percent
Complications (95))	67	19
Deaths	3	0.86
Wound Infections	5	1.4

Figure 5

It is instructive to look at these complications from the point of view of the circumstances of surgery. This gives a more realistic appraisal of the true morbidity of this operation. For this reason, the patients were divided into three groups, depending upon whether their surgery was elective, elective-acute, or emergency. Elective refers to patients who were diagnosed as having gallbladder disease and were admitted to the hospital for the purpose of elective cholecystectomy. The elective-acute patients were those who were admitted to the hospital with acute cholecystitis and were operated upon without allowing their acute cholecystitis to resolve. The emergency patients were those who failed to respond to conservative treatment or whose symptoms were alarming enough to require immediate surgery.

Complications (349 patients)

Urinary Tract Infection	15
Ileus	10
Atelectasis	7
FUO	7
Urinary Retention	6
Cardiac Arrhythmia	5
Wound Infection	5
Cardiac Decompensation	4
Re-explored	4
Pancreatitis	3
CVA	1
Intra-abdominal Abscess	1
Wound Dehiscence	1
Myocardial Ischemia	1
Hernia	1
Others	22

Figure 6

The elective cholecystectomies included 284 patients or 81% (Figure 7). Forty-eight of these patients suffered some postoperative complications or 17%. There were no deaths in this group and only two wound infections for a rate of 0.7%.

Elective Cholecystectomy (284 patients)

	Number of Patients	Percent
Complications (58)	48	17
Deaths	0	0
Wound Infections	2	0.7

Figure 7

The elective-acutes numbered 39 patients, or 11% of the series. Their complication rate was only 15% (Figure 8). It is generally felt that the risk of operating in an acute situation is higher than in an elective situation. Although the numbers are not sufficient for statistical validity, that did not appear to be the case in this group. There were no deaths and no wound infections among these 39 patients. There were 25 patients or 7% in the emergency surgery group (Figure 9). These patients were generally older, and as was pointed out by Dr. Benjamin[1] in his 1958 study, had their gallbladder disease for a considerably longer period of time. Fifty-two percent of these patients suffered postoperative complications and those who had a complication had over two complications each. All of the deaths were in this group for an operative mortality rate of 12% and three wound infections for a rate of 12%.

Elective Acute Cholecystitis (39 patients)

	Number of Patients	Percent
Complications (6)	6	15
Deaths	0	
Wound Infections	0	

Figure 8

Emergency Cholecystectomy (25 patients)

	Number of Patients	Percent
Complications (29)	13	52
Deaths	3	12
Wound Infections	3	12

Figure 9

Case Reports

The three deaths in this series were as follows:

Case 1

An 81-year-old white male was admitted to the hospital with jaundice and an elevated alkaline phosphatase. On physical examination, he had a painful mass in the right upper quadrant, and, of interest in retrospect, an audible bruit over the carotid artery. His past medical history was significant in that he had arteriosclerotic cardiovascular disease with atrial fibrillation and had suffered cardiac decompensation in the past. His surgery consisted of cholecystostomy and drainage of an intra-abdominal abscess. On the third postoperative day he suffered a cerebrovascular accident with hemiparesis. He then developed congestive heart failure and expired.

Case 2

An 81-year-old white female was admitted to the hospital with jaundice and a painful right upper quadrant mass. She was described on physical examination as cachectic, febrile, and suffering from abdominal pain. Surgery consisted of cholecystectomy, drainage of an intra-abdominal abscess and a choledochoduodenostomy. On the seventh postoperative day she suffered a wound dehiscence which was closed. On the sixteenth postoperative day she was discharged but was readmitted on the twenty-first postoperative day with an abdominal catastrophe. Because of her clinical state, she was not reexplored and expired on the twenty-sixth postoperative day. At autopsy, she was noted to have peritonitis, ascending cholangitis, a subhepatic abscess, and a colocutaneous fistula.

Case 3

A 40-year-old white female was diabetic and being maintained on chronic hemodialysis because of diabetic nephropathy. She had a history of relapsing pancreatitis with a pseudocyst. Surgery consisted of cholecystectomy and cystogastrostomy. She died on the twenty-third postoperative day of multiple organ system failure.

A final factor which is pertinent to any discussion of gallbladder disease and morbidity is that of biliary tract cancer. The exact etiology of biliary tract cancer is unknown, but in the vast majority of cases it is related to or associated with calculus gallbladder disease. In this series of 349 procedures, there were five instances of gallbladder cancer diagnosed for an incidence of 1.4%. There were an additional two cases of biliary tract cancer in the group of 48 patients who had common bile duct disease, so in this four-year period the incidence of cancer associated with biliary tract disease at this center was 1.8%. There were an additional two instances in which cancer was found metastatic to the gallbladder. One was a case of hypernephroma which had spread to the gallbladder by direct extension, and the second was a case of malignant melanoma with metastases in the gallbladder. The overall incidence of malignancy involving the biliary tract was therefore 2.3%.

Discussion

For most of this century, the accepted treatment for biliary tract disease has been surgical. In the case of symptomatic patients, undoubtedly this will continue to be the standard form of therapy for the foreseeable future. This is a justified approach to the problem since it has been demonstrated consistently in the past and also in this study, that surgical removal of the gallbladder is safe and effective in relieving the symptoms of this malady. In this series, the mortality rate in elective cholecystectomy was 0 and the wound infection rate less than 1%, with a minimal morbidity overall and an acceptably short hospital course. It would seem also that fairly early surgery would be considerably safer for patients than allowing them to progress to a more chronic and potentially much more serious stage of their disease.

The situation in the case of asymptomatic gallbladder disease, however, is more problematical. By careful history, many so-called silent gallstones are found to be symptomatic, but nevertheless it is difficult for the clinician to encourage surgery in a patient who is feeling well. It has been the policy of our surgery department to recommend surgery for patients with silent gallstones based on the development of symptoms relative to the gallstones within 10 years of their diagnosis in 50% of patients. There is also a small but real incidence of malignancy associated with gallstones. It is clear that this group of patients can submit to surgery with the expectation of minimal morbidity and mortality.

Recently, a new approach to this problem has been reported. This potential breakthrough consists of the use of oral chenodeoxycholic acid for the dissolution of gallstones. This approach was first reported successfully from the Mayo Clinic in 1972,[3] and is currently undergoing testing at a large multi-institutional setting. There are several problems inherent in this program, however. In the early studies it has been only 50% successful in eliminating gallstones. In addition, it has several actual and potential side effects including a tendency to produce diarrhea and elevation of serum enzymes such as SGOT. The substance is hepatotoxic in subhuman primates and has potential for adverse effects on cholesterol metabolism and for producing gastritis. These latter problems have not been clinically significant in human trials. It is interesting, however, that if this substance had been tested initially on subhuman species, it probably would not have been released for human use because of its toxicity. There is the likelihood that stones will recur following discontinuation of the drug and, in one brief report, there was a 20% recurrence of gallstones within three years. This leads to the likelihood of the necessity for a lifetime use of the drug to prevent recurrence of gallstones. The current criteria for use of chenodeoxycholic acid are minor symptoms, a functioning gallbladder, noncalcified stones, and stones which are not larger than 2 cm in diameter in patients who are not pregnant or in the childbearing age. In our series of patients there were only 37, or 11%, who fit these criteria and would have been candidates for nonsurgical treatment.

It would appear, therefore, that despite the promise of this new mode of treatment the major therapy for this disease process will continue to be surgical removal of the gallbladder.

Summary

This paper has presented a review of a series of 349 operative procedures for gallbladder disease done in a private clinic setting. The study demonstrates that this procedure can be accomplished with an overall morbidity rate of less than 20% and a mortality rate of less than 1%. In elective cases, the mortality rate approaches 0%. The clinician can, therefore, with confidence recommend surgical treatment to his patient with the expectation that he can safely eliminate symptomatology if present and, additionally, can prevent more severe and potentially devastating complications in the future.

References

1. Benjamin RB: Cholecystectomy: a review of one hundred consecutive cases. The Bul St Louis Park Med Ctr (Minneapolis) 2:139, 1958.
2. Bremner DN, McCormick JS, Thomsen JW and McNair TJ: A study of cholecystectomy. Surg Gynecol Obstet 138:752, 1974.
3. Danzinger RG, Hofmann AF, Schoenfield LJ and Johnson LT: Dissolution of cholesterol gallstones by chenodeoxycholic acid. N Engl J Med 286:1, 1972.

Harold A. Diehl Award

The committee for the Diehl Award given annually by the Minnesota Medical Alumni Association solicits nominations for this award from the physicians of Minnesota. The award is presented to one or more physicians meeting these four major criteria:

1. Preferably an alumnus of the University of Minnesota Medical School.
2. Not engaged in an academic capacity.
3. Has made outstanding contributions to the Medical School, the University, the Alumni.
4. Has a relatively long experience in the field of medical science or a related field.

Nominations for the 1977 awards should be sent immediately to:

Konald A. Prem, M.D.
Chairman, Diehl Award
Box 395
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Change of Address

Please send in any changes in address to the Minnesota State Medical Association, 101 E. 5th St. #900, St. Paul 55101. The new 1977 roster is being assembled, and address changes should be listed.

Exploring Hidden Passages

New Look at Pancreatic and Biliary Ducts

MICHAEL LEVY, M.D.*

Endoscopic retrograde cholangiopancreatography and percutaneous transhepatic cholangiography allow us to evaluate patients with diseases of the pancreatic and biliary ducts with ease and accuracy never before possible. The risks are minimal and the information obtained by these studies is helpful in the treatment of patients with biliary or pancreatic conditions.

In the late 1960's, Olympus, manufacturer of fibroptic endoscopes, produced a side-viewing duodenoscope. It was longer and thinner than the gastroscopes then in use and, most important, the biopsy channel had an elevator that could be used to move whatever was in the channel. Shortly after people looked at the ampulla of Vater, they began to cannulate it. This procedure, called endoscopic retrograde cholangiopancreatography (ERCP), was first done in Japan in 1969. The initial success rate was about 25%. This gradually improved and success rates of between 75 and 90% are reported in cannulating the biliary and pancreatic duct systems. Since this procedure was last reported in this publication,[1] its indications and risks have been more carefully delineated. Our series, though small, is very typical of the experience around the rest of the country. We started in 1973 and our initial success rate was about 25%. Since then, we have done 176 cases and our overall success rate is 74% in getting the duct desired. We have become increasingly successful as our experience has increased.

Successful evaluation of the biliary duct has been enhanced by another procedure, the resurrected technique of percutaneous transhepatic cholangiography (PTC). This is now being done with an extremely flexible, blunt beveled 22-gauge steel needle six or eight inches long. It would be a rare patient whose cardiorespiratory status was so poor that one of these procedures could not be done. The most important absolute contraindication would be poor blood clotting making PTC impossible. The presence of sepsis in a jaundiced patient would significantly increase the risks of both procedures. This is just the patient in whom it would be crucial to know if the biliary tree is obstructed. Duodenal obstruction makes ERCP impossible and severe duodenal inflammatory disease, or a Bilroth II gastrectomy makes the procedure difficult.

In our experience there were no patients in whom one or the other could not be attempted. Only once did we have to terminate a procedure already started; that patient developed a cardiac arrhythmia.

Biliary Tree

Pre-surgical evaluation of the biliary tree should always be done when obstructive biliary tract disease is suspected. This is true for both patients who appear to have obstructive jaundice and those patients with known parenchymal disease who suddenly deteriorate and might possibly have extrahepatic biliary disease. Of 54 patients who were thought to have obstructive jaundice, the bile duct was cannulated in 41, and eight were found to have a normal, non-obstructed biliary tree. Of these eight, the youngest was a 15-year-old girl with repeated episodes of RUQ pain and a non-functioning gallbladder. A liver biopsy after her normal duct study showed Dubin-Johnson disease. The oldest was an 84-year-old lady with known malignancy. She became jaundiced, and it was assumed to be from her malignancy. She had drug induced cholestatic jaundice. We have been very successful in determining both the type of obstruction and its location. On only one occasion did we miss the location of the obstruction and that was because of the sludge below the obstruction in the common bile duct.

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In evaluating jaundiced patients, we have been doing ERCP first. If the biliary tree cannot be visualized by this method, we then do PTC. Other centers do PTC first. Our reasoning is that PTC can easily be done immediately after ERCP. We are less willing to move and turn patients for ERCP immediately after five or six needle punctures of the liver from an unsuccessful PTC.

A percutaneous transhepatic cholangiogram was performed in our last five jaundiced patients in whom ERCP was not successful. In one patient no ducts could be filled, and a liver biopsy showed alcoholic hepatitis. The fifth patient had severe pain during the procedure and at surgery was found to have multiple hepatic metastases. Obstruction was shown in the other three.

ERCP is an excellent way to evaluate patients with RUQ pain following cholecystectomy. Nineteen of these 24 patients were successfully cannulated; 14 were found to have stones and four others had strictures without stones. These people presented just as the others did but had dilated ducts and a terminal biliary constriction. The reason for the pain in these patients is not known. It could be that they periodically pass small stones or that there are spasms of the terminal biliary sphincter. One patient in our series was found to have cystic duct stones. All of the patients with stones had previous cholecystectomies. One patient had a cholecystectomy 22 years before her first episode of pain and a stone was demonstrated.

The advantages of ERCP to evaluate the biliary tree are quite obvious. It can be done irrespective of the level of bilirubin and at any time. It takes the place of an upper GI series, oral cholecystogram, intravenous cholangiogram, liver and CAT scans. A patient who enters the hospital with obstructive jaundice can often be worked up in a few hours and be ready for surgery the next day. The extra cost of ERCP over routine Xrays can easily be balanced by the fact that the workup is compressed from several days to a few hours. It is our present procedure to follow ERCP in a jaundiced patient with PTC. It is felt that if bile ducts are not visualized after four to six

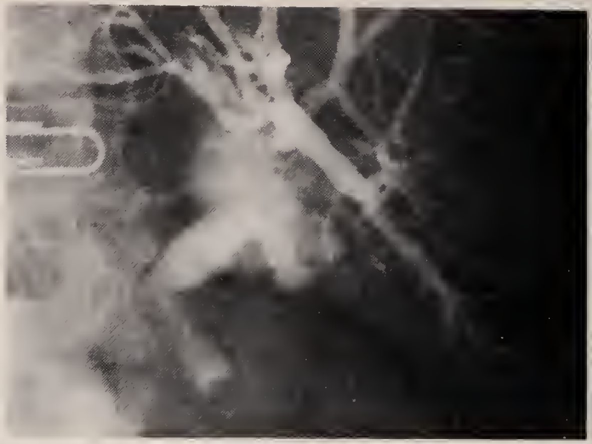

Fig. 1—A percutaneous transhepatic cholangiogram with a 22-gauge needle showing dilated intrahepatic ducts and a long common bile duct with stones near the ampulla of Vater. The clip seen is for reference purposes during the injection under fluoroscopic control. The patient was a 54-year-old woman with what was thought to be a second episode of drug induced jaundice. An ERCP was unsuccessful because dye could not be injected retrograde into the common bile duct.

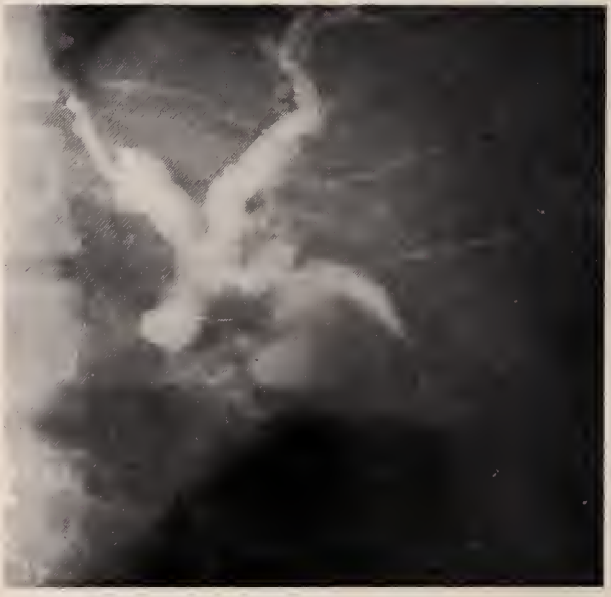

Fig. 2—A percutaneous transhepatic cholangiogram using a 22-gauge needle in a patient whose bile duct was totally obstructed. This was secondary to the bile duct being tied off at the time of a routine cholecystectomy two weeks before. The blunting of the common bile duct is well seen as well as the dilatation of the intraheptic ducts.

passes, the patient does not have dilated bile ducts, and we then do a liver biopsy.

Pancreatic Duct

Study of the pancreatic duct of ERCP is most often performed in an attempt to diagnose pancreatic cancer or pancreatitis. Cancer can involve either the main duct system or an accessory duct. Stenosis or obstruction of the main pancreatic duct with or without proximal duct dilatation is a characteristic abnormality of pancreatic carcinoma. It is, unfortunately, difficult to separate carcinoma from localized pancreatitis by this study. A pancreatic tumor which does not involve the ducts or pancreas located in the accessory duct system may not be seen. It is hoped that injecting secretin in patients suspected of having pancreatic disease and using the duodenoscope catheter to obtain fluid for enzyme studies and cytology will further discriminate pancreatitis from pancreatic carcinoma.[2] ERCP does not appear to be useful in young patients with abdominal pain and no weight loss. We did eight of those and they all had normal pancreatic ducts. Dye can be injected into pseudocysts, but unless there is a real diagnostic dilemma or surgery is about to be performed, it can be dangerous, causing sepsis.

In a recent survey of 10,000 ERCP procedures,[3] the overall complication rate was 3%; the fatality rate was .2%. Of the 15 deaths, 13 died of sepsis. Of the eight deaths due to cholangic sepsis, all had obstructed ducts and seven of those eight had a tumor. These deaths comprised a full 10% of those patients who had sepsis. This problem results from getting dye above an obstruction and is handled by giving the patient antibiotics and surgically relieving the obstruction as soon as possible. The death rate in pancreatic sepsis was 20%, and four or five of those had a tumor-obstructed duct. Pseudocysts became easily infected. Of the other two deaths, one was an incidental variceal bleeding immediately after cannulation and the other one was following a perforation. Three people were perforated, all of whom had altered anatomy such as Bilroth II anastomoses or other peculiarities. At least 1% of patients had post-procedure pancreatitis, but this was almost always mild and not a problem.

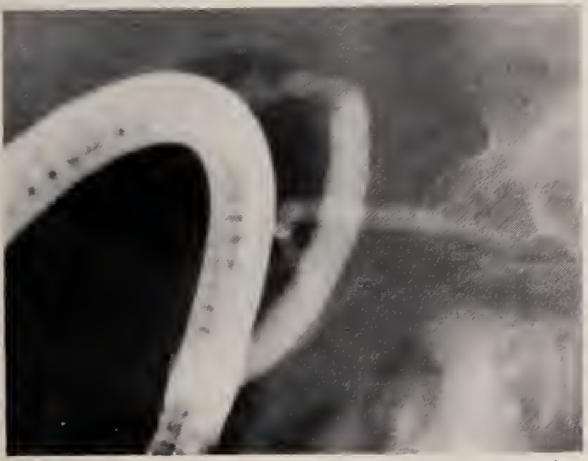

Fig. 3—An endoscopic retrograde duct cannulation showing obliteration of the common bile duct just above the pancreatic duct, and inadequate filling of the pancreatic duct itself. The patient had pancreatic carcinoma with growth around the common bile duct. The patient presented with painless jaundice.

Complications also occur with PTC. They are the expected ones of sepsis, blood loss, and bile leakage from obstructed ducts. Sepsis and bile leakage can be minimized by removing bile at the end of the procedure, but this is difficult through such a small bore needle. The exact incidence of these complications has not yet been established. If an obstructed duct is demonstrated it is best to start antibiotics and schedule for surgery as soon as possible. It is not necessary to rush to surgery immediately.

We have had no deaths in our series. We know we have missed at least two diagnoses. One was a patient who had carcinoma of the tail of the pancreas; and we simply did not fill out enough of the pancreatic duct. The other was a patient who had multiple small stones in his gallbladder. Our only serious complication was in a patient who retched while the endoscope was retroverted in his stomach and it became impacted in his esophagus. We were initially unable to remove it. It finally came free when the patient was anesthetized on the operating table.

Conclusion

The endoscopic or percutaneous evaluation of the biliary tree and the endoscopic evaluation of the pancreatic duct system can now be performed with success, ease, and rapidity. It is essential to evaluate all jaundiced patients in this manner prior to surgery. Surgery has been avoided in a full 25% of patients in many series who have been thought to have obstructive jaundice because these procedures have shown normal intrahepatic and extrahepatic biliary ducts. Our small series corroborates this. An additional 15% of people with known hepatic disease and a sudden increase in jaundice have been found to have surgical lesions in their biliary systems.

The use of percutaneous transhepatic cholangiography has significantly increased our success in evaluating the jaundiced patient in whom ERCP is not successful. It has the advantage of not requiring an expensive endoscope or an experienced endoscopist. It can take the place of ERCP in evaluating the jaundiced patient when ERCP is not available. Combining the two procedures gives better results than either one used separately. ERCP is the best way to evaluate patients with RUQ pain following cholecystectomy, if an IVC does not show stones. In our own series, 73% of these patients had biliary duct stones, and we were then able to delineate their size, number, and location as long as 22 years after their cholecystectomy.

Things are less clear for the pancreatic duct. We cannot distinguish localized pancreatitis from carcinoma. We cannot tell which patient with chronic pancreatitis has carcinoma and in only 74% of our patients with known carcinoma was the duct study abnormal. It will show changes of chronic pancreatitis in the main duct and show which patients with pancreatitis are amenable to surgical correction, and which type of surgery would be most helpful. Combined with the cytologic study of the pancreatic fluid, it may pick up carcinoma earlier than previously possible. We can expect to continue using and refining these procedures until they are supplanted by other tests.

References

1. Belsito A and Dickinson P: Duodenoscopy and retrograde cholangiopancreatography; a new method of diagnosis of obstructive jaundice. Minn Med 56:859, 1973.
2. Kawanishi H, Sell JE and Pollard HM: Combined endoscopic pancreatic fluid collection and retrograde pancreatography in the diagnosis of pancreatic cancer and chronic pancreatitis. Gastrointest Endosc 22:82, 1975.
3. Bilboa MK, Dotter CT, Lee TG and Katon RM: Complications of endoscopic retrograde cholangiopancreatography (ERC). A study of 10,000 cases. Gastroenterology 70:314, 1976.

Cover Photograph

"Lily Pads"

Dr. Donald C. Bell, an internist practicing in the Minneapolis area, snapped the lily pads featured on the cover at Camp Lake, which is in Crow Wing County, near Lake Mille Lacs.

It was a light overcast day when the sun was visable, but its light intensity was much reduced. The picture was taken of the lily pads which were eight to ten feet away from the dock on which I was standing with a zoom telophoto lens at approximately 135 millimeters setting. The picture was taken approximately one diaphragm stop lower than the meter setting in order to produce a somewhat underexposed picture for a "mood" effect. The reflection of the sun was centered in the lily pad to give the "halo effect."

Changing Management of Hip Fractures

LEO J. DE SOUZA, M.B., F.R.C.S.Ed., F.R.C.S.(C)*

Advances in the management of femoral neck and trochanteric fractures over the last 25 years are described in the light of new concepts and classification, development of internal fixation devices and evolution of indications for prosthesis. Stress is laid on total patient care as well as accurate reduction of the femoral neck fractures and stabilization of the unstable trochanteric fractures.

FRACTURE OF THE HIP is a common problem posing an uncommon catastrophe for the patient and the family. In the elderly, whom it usually afflicts, it is often looked upon as the last milestone before the tombstone. It is the most common cause of death from trauma after the age of 75.[1] Even if death should not supervene, the expectation of life is reduced,[2,3] and often the remaining years are characterized by pain, by an inability to ambulate normally and to care for oneself, and by an utter dependence on relatives, friends, or the nursing home.

Femoral Neck Fractures

As recently as 25 years ago, McCarroll[4] relabeled the femoral neck fracture as the "unsolved fracture," Kellogg-Speed having so christened it many years earlier. McCarroll reported an incidence of 40% for avascular necrosis and 25% for nonunion. At the Campbell Clinic, Memphis, the incidence of avascular necrosis was 33.6%, non-union 13.5%, unsatisfactory end results 49.1% and mortality 9.3%.[5] Such was the picture 25 years ago. What, if any, have the changes been since then.

Classification

A sound classification of a problem can only evolve from a sound understanding of it. Until recently, the classification most widely used was that of Pauwels.[6] Pauwels' classification could only be used after the fracture was reduced and did not relate to prognosis. The Garden classification,[7] currently in favor, is intended to correlate the initial radiological appearance with the degree of vascular damage to the posterior retinacular vessels supplying the femoral head. In this classification, the direction of the medial trabeculae in the capital fragment is used to indicate the degree of rotation of the fragment in the anteroposterior radiograph. The medial trabeculae normally lie in alignment with the trabeculae in the acetabulum. In Stage I, the subcapital fracture is incomplete and the femoral head is tilted into a valgus position; in Stage II, the fracture is complete but undisplaced. In Stage III, where the fracture is complete with partial displacement, the head is tilted into varus and the medial trabeculae are out of line with the corresponding trabeculae in the acetabulum. Garden feels that this occurs if there is still some posterior soft tissue contact between the femoral head and the neck. In Stage IV, where the fracture is complete with full displacement, the soft tissue attachments between the head and the neck are completely torn, allowing the head to rotate back to its normal position in the acetabulum.

In Stage I and II fractures, there is no damage to the retinacular vessels. They go on to heal satisfactorily and can be removed from the category of the "unsolved fracture" as far as union is concerned. In Stage III, there is partial damage to these vessels, and in Stage IV, there is complete damage. We are therefore able to prognosti-

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See editorial, page 353.

cate the eventual outcome with a greater degree of accuracy and state that more problems will be encountered in the latter two stages. A recent review by Barnes et al.[8] showed that with few exceptions union occurred in all Stage I and II fractures and in a little over two-thirds of Stage III and IV fractures. In addition, Stage I and II fractures united much earlier than Stage III and IV, 62.5% of Stage I, 17% of Stage III, and 12% of Stage IV having united at six months. The incidence of late segmental collapse was also much lower in Stage I fractures, being 16% compared to the incidence of 27.6% in Stages III and IV.

Normal Alignment Reduction

It used to be thought that reduction was the least of our problems; it is now being realized that it is probably the greatest. In fact, Garden has this to say: "I have long been convinced that the solution of this problem will come not from the innovator of this or that fixation appliance or procedure, but from the surgeon who can show us how to reduce every displaced subcapital fracture with its fragments in their normal alignment."[9]

To this end, Garden has suggested that a common and acceptable yardstick of reduction be found and that it is not enough to say that the reduction is good, fair or poor. It is mandatory that a "normal alignment" reduction be obtained. In the frontal view, the angle formed by the medial trabeculae in the femoral head with the medial cortex of the femoral shaft is 160°. In the lateral view, the central axis of the head and the central axis of the neck lie in a straight angle of 180°. An average alignment of good reduction can therefore be expressed as 160/180. An alignment index of less than 150 and more than 185 constitutes malreduction.[10]

The importance of obtaining satisfactory reduction has now become clear. The long-term results of healed fractures invariably show that the capital fragment maintains its integrity when the fragments are aligned within the narrow limits of good reduction, but undergoes avascular necrosis when reduction is poor. Also, and just as important, the rate of union has been found to be directly related to the quality of reduction, irrespective of the type of internal fixation used; in this regard, Barnes et al. state that it is a "most serious mistake to accept either a 'varus' deformity in the anteroposterior radiograph or severe angulation of the fragment in the lateral radiograph."[8]

The accent has been and is on closed reduction, and in almost all cases acceptable normal alignment reduction is achieved. However, at some time or another, there is the difficult case where acceptable reduction will not be obtained by closed means. In such a case, open reduction now becomes mandatory. This is easily carried out by opening the capsule through the anterolateral Watson-Jones approach. No increased incidence of avascular necrosis or non-union has been noted from this procedure as previously believed.

Adequate Fixation

Von Langenbeck was probably the first to use a nail for the fractured hip; and although Hey Groves in England is reputed to be the first to use a triflanged nail, it was popularized by Smith-Peterson. Until recently, the Smith-Peterson nail was the most widely used nail.

During the last decade, however, internal fixation has been greatly improved by the introduction of sounder principles and better devices, and this has helped raise the rate of union to 90% or even better. The requirements for stable fixation include adequate purchase in the femoral head (midline or lower in the anteroposterior view and posterior in the lateral view), fixation to the lateral femoral shaft, a nail angle of 135° or more to avoid shear, adequate strength of the device, ability of the device to slide, collapse or telescope, and firm impaction or compression.[11]

In the Minneapolis-St. Paul area, the Massie telescoping nail with the unique side plate is used almost exclusively. I believe, however, that the Richard's compression hip system, consisting of a screw, the shaft of which fits into a slotted barrel connected at an angle to the plate, has greater advantages in that the compression screw enables the surgeon to apply compression at the fracture site, ensuring rigid fixation. The heavy duty angle plate allows early weight bearing in a greater number of patients. The use of newer internal fixation devices has lowered the incidence of non-union, but no device has yet been shown to influence the incidence of avascular necrosis in united fracture of the femoral neck.

Precise Indications for Prosthesis

Twenty-five years ago Thompson of New York developed an endoprosthetic replacement for use in displaced intracapsular fractures. Austin Moore of Philadelphia developed a similar prosthesis. Hope re-kindled again for the "unsolved fracture" and it was felt that at last an answer might be found for nonunion and avascular necrosis, and for months of non-weight bearing and arthritis. But this early promise was never fulfilled. Hunter,[12] comparing the results of internal fixation with primary prosthetic replacement for fresh femoral neck fractures for the period 1963-67 at Oxford, England, reported deep wound infection in 8.5% and a mortality rate of 16% at the end of one month and 41% at the end of six months in those treated by prosthetic replacement. He repeated the study in Toronto, Canada, for a similar period from 1968-72 and came up with similar findings concluding that in the choice between "pin or prosthesis," internal fixation offered the patient a lower morbidity and mortality rate and better results than the insertion of the prosthesis[13] In the prosthesis group, Hunter found the rate of wound infection to be 9%, mortality at the end of one month 11%, and at the end of six months 24%.

Frederick R. Thompson,[14] reviewing 25 years of experience at the annual meeting of the American Academy of Orthopedic Surgeons in 1974, advised that prosthetic replacement, although a satisfactory procedure, should not be used when hip nailing is indicated and possible. He noted that a longer hospital stay and higher infection and mortality rates occurred with prosthetic replacement. He reiterated that the indications be precise, and, in his view, primarily replacement prosthesis should be reserved primarily for a fracture that cannot be satisfactorily reduced or securely nailed, for a fracture associated with dislocation or injury to the head, and for the aged patient, especially 85 and over. If a joint is normal and indications exist, insertion of a prosthesis is favored; in the rare case where a joint is abnormal, either from extensive degenerative disease or from extensive injury, total hip replacement is favored. In the young adult, where a fracture is complicated by dislocation or injury to the head, the muscle pedicle bone graft as suggested by Meyers et al.[15] is the preferred alternative, as no prosthetic replacement can ever be a satisfactory substitute for a normal femoral head, particularly in the young.

Preoperative Assessment and Postoperative Care

What has been presented so far pertains to the fracture itself, and while the bad results of nailing are often the results of bad nailing, the patient as a whole merits equal attention and does receive it. Careful preoperative evaluation and preparation, prompt surgery thereafter and excellent geriatric anesthesia have made the procedure immeasurably safer.

A major advance has been the use of the image-intensifier in the radiological control necessary in the operative treatment. This has resulted in reduction of the operating time by nearly 50% and in the increased finesse of the operative technique. Postoperatively, aggressive but individualized physical therapy has helped speed up return to normality.

Thromboembolism is the most common serious postoperative complication, occurring in about half of the patients, often without clinical signs. Sevitt,[16] a pioneer investigator working at the Birmingham Accident Hospital, England, in the late fifties, found that deep venous thrombosis was present at postmorten in 83% of the patients who died following hip fractures and that only one-third of the patients who died as a result of massive or recurrent emboli were diagnosed antemortem.[17]

Special sophisticated tests have now been evolved for more reliable detection of deep venous thrombosis in the limbs. These are roentgenographic venography, which is currently the most accurate method, the labeled fibrinogen uptake test, and the use of the noninvasive cuff-impedance phlebography and the Doppler ultrasound test.

Prevention is the hallmark of treatment for thromboembolic disease and the use of prophylactic anticoagulants has been shown to significantly reduce the incidence of deep venous thrombosis. Evarts,[18] using Dextran 40 in elective hip operations, showed a drop in incidence from 50% to 4.3% with only 1% nonfatal pulmonary emboli. Castle and Orinion,[19] using sodium warfarin mainly in hip fractures, showed a drop from 28.7% to 3.6% with no fatalities; and Sharnoff et al.,[20] using small dose heparin given subcutaneously and adequately monitored from the time of admission to the time of full mobilization, demonstrated a drop in the incidence of fatal pulmonary embolism from 3.5% to 0.0.%. The use of prophylactic anticoagulants, however, has not become widely prevalent, and only a tenth of the orthopedic surgeons use it on a routine basis and a third in selected patients with hip fractures.[21]

Present Picture

With an average follow-up in excess of five years, the incidence of avascular necrosis in displaced fractures still remains around 33%.[22,23] With adequate reduction and accurate internal fixation, after impaction or compression, the femoral neck fracture can be expected to unit in at least 90% of the patients.[23,24] The mortality figures at the end of one month are 1.5% and approximately 80% are now able to walk without significant pain.

Trochanteric Fractures

Twenty-five years ago this fracture was treated rather nonchalantly on the basis that they always united. The high rate of fracture union and the almost complete absence of avascular necrosis of the femoral head resulted in a complacent attitude toward the management of this common but difficult fracture, often called the "forgotten fracture." Over the years since surgical management has become the standard method of treatment, there has been increasing recognition that complications from internal fixation are not at all uncommon.

The greatest advance that has taken place in the management is the concept that the trochanteric fracture can be stable or unstable;[25] that for the stable fracture conventional treatment or fixation is excellent, but that for the unstable fracture something more may be necessary. An unstable fracture is one where the main buttresses or pillars are fractured and comminuted; these include the medial cortex involving the lesser trochanter and the posterior cortex involving the shaft. The treatment of the unstable fracture needs to be altered from the "conventional reduction" and internal fixation to prevent development of varus deformity with or without nonunion. In such an unstable situation, the nail will penetrate the head or the internal fixation device will fail completely, with breakage or bending at the center, or with loss of fixation at either end.

Various methods have been evolved wherein an unstable fracture is rendered stable and then, and only then, internally fixed. Hughston and Dimon,[26] and Tronzo[27] recommend medial displacement, impaction and then fixation; Sarmiento[28] recommends apposition of the medial cortices in valgus and fixation with a special I-beam nail. In younger patients, the ASIF[29] method of interfragmental compression and a tension band plate is preferred. Experience gained in the use of methylmethacrylate in joint replacement surgery has provided fringe benefits in other areas. In the unstable fracture in the elderly with very poor and osteoporotic bone, methylmethacrylate provides an excellent "stock" when used in conjunction with standard internal fixation.

Gustilo et al.[30] in analyzing the results of treating trochanteric fractures over the past 25 years at the Hennepin County Medical Center, Minneapolis, have come to the conclusion that conventional fixation with the 150° Massie nail alone provides reliable fixation in the unstable fracture, allowing controlled collapse to a stable position. The differentiation of the stable from the unstable trochanteric fracture marks an advance in thinking about this fracture; we recognize now that the stable fracture is no problem but that the unstable fracture may be problematical.

Present Picture

A significant reduction in mortality has been noted over the years,[30] from 17.5% to 4.5%, and approximately 95% are now able to walk without significant pain, as compared to 75% 25 years ago.

Conclusion

In conclusion, it may be stated that the elderly, usually female, patient with a fractured hip can now, 25 years later, look forward to better days. She can look forward to surviving the ordeal 97 out of 100 times, thanks to better care and anesthesia, to blood transfusions and anticoagulants, to physical therapy and early weight-bearing. She can look forward to being able to walk without significant pain 88 out of 100 times, thanks to improved understanding of the fracture, accurate reduction or stabilization, and improved internal fixation.

However, we are still acutely aware that we do not have all the answers yet and therefore need to press on at all times to gain more insight into the problem, little though it may be each time.

References

1. Wainwright D: Fracture of the neck of the femur. Injury 1:90, 1969.
2. Katz S, Heiple KG, Downs TD, Ford AB and Scott CP: Long term course of 147 patients with fracture of the hip. Surg Gynec Obstet 124:1219, 1967.
3. Ohman U, Bjorkegran NA and Fahlstom G: Fractures of the femoral neck, a five year review. Acta Chir Scand 135:27, 1969.
4. McCarroll HR: Has a solution for the "unsolved fracture" been found? JAMA 153:536, 1953.
5. Boyd HB and George IL: Complications of fractures of the neck of the femur. J Bone Joint Surg (AM) 29:13, 1947.
6. Pauwels F: Der Schenkelhalsbruch: ein mechanisches problem. Grundlagen des Heilungsvorganges prognose und kausale therapie. S32 und 33. (Beilageheft z. Ztsch. f. Orthop Chir 63) Stuttgard, Ferninand Enke, 1935.
7. Garden RS: Low-angle fixation in fractures of the femoral neck. J Bone Joint Surg (Brit) 43:647, 1961.
8. Barnes R, Brown JT, Garden RS and Nicoll EA: Subcapital fractures of the femur. A prospective review. J Bone Joint Surg (Brit) 58:2, 1976.
9. Garden RS: Reduction and fixation of subcapital fracture of the femur. Orthop Clin North Am 5:683, 1974.
10. Garden RS: Malreduction and avascular necrosis in subcapital fractures of the femur. — Bone Joint Surg (Brit) 53:183, 1971.
11. Barr JS: The use of a sliding nail in subcapital fractures. AAOS Instructional Course, Dallas, Jan 1974.
12. Hunter GA: A comparison of the use of the internal fixation and prosthetic replacement for fresh fractures of the neck of the femur. Brit J Surg 56:229, 1969.
13. Hunter GA: A further comparison of the use of internal fixation and prosthetic replacement for fresh fractures of the neck of the femur. Brit J Surg 61:382, 1974.
14. Thompson FR, Unis GL and Unis W: Displaced intra-capsular hip fractures—a comparison between hip nailing and prosthetic replacement. 41st Annual meeting of the AAOS, Dallas, Jan 1974.
15. Meyers MH, Harvey JP Jr and Moore TM: Treatment of displaced subcapital and transcervical fractures of the femoral neck by muscle-pedicle-bone graft and internal fixation. J Bone Joint Surg (Am) 55:257, 1973.
16. Sevitt S and Gallagher N: Venous thrombosis and pulmonary embolism: a clinicopathological study in injured and burned patients. Brit J Surg 48:475, 1961.
17. Sevitt S and Gallagher NG: Prevention of venous thrombosis and pulmonary embolism in injured patients. Lancet 2:981, 1959.
18. Evarts CM and Feil EI: Prevention of thromboembolic disease after elective surgery of the hip. J Bone Joint Surg (Am) 53:1271, 1971.
19. Castle ME and Orinion EA: Prophylactic anticoagulation in fractures. J Bone Joint Surg (Am) 52:521, 1970.
20. Sharnoff JG, Rosen RL, Sadler AH and Ibarra-Isunza GC: Prevention of fatal pulmonary thromboembolism by heparin prophylaxis after surgery for hip fractures. J Bone Joint Surg (Am) 58:913, 1976.
21. Simon TL and Stengle JM: Antithrombotic practice in orthopedic surgery. Clin Orthop 102:181, 1974.
22. Massie WK: Treatment of femoral neck fractures, emphasizing long term follow-up observations on aseptic necrosis. Clin Orthop 92:16, 1973.
23. Kuslich SD, Premer RF and Gustilo RB: Femoral neck fractures (in press).
24. Banks HH: Non-union in fractures of the femoral neck. Orthop Clin North Am 5:865, 1974.
25. Evans EM: Trochanteric fractures—a review of 110 cases treated by nailplate fixation. J Bone Joint Surg (Am) 49:440, 1967.
27. Tronzo RG: Surgery of the Hip Joint. Lea & Febiger, Philadelphia, 1973.
28. Sarmiento A: Unstable intertrochanteric fractures of the femur. Clin Orthop 92:77, 1973.
29. Muller ME, Allgower M and Willenegger H: Manual of Internal Fixation. Springer-Verlag, New York, Heidelberg, Berlin, 1970.
30. Gustilo RB, Kyle RF and Bocklage JF: An analysis of 762 intertrochanteric fractures at Hennepin County Medical Center (in press).

Woman's Auxiliary

Hennepin County Medical Society

"From Buggy to Baroque," is the theme of Hennepin County Medical Society Auxiliary's May 13, 14 & 15 Antique Show and Sale to be held at the Mpls. National Guard Armory, 500 South 6th Street.

Physicians are encouraged to attend this outstanding event, as the proceeds will be going to the Foundation of the Minnesota State Medical Association Student Loan Fund for medical school education. Every year there are more applications for loans than money available. With your backing and support we are sure to make this a successful project for an excellent cause.

Preview Dinner is May 13th, 6:30 p.m. to 11:00 p.m. Tickets are $25.00. ($15.00 tax deductible). For tickets for this gala evening write: Mrs. William C. Woyda, 3617 Beard Ave. North, Minneapolis, Minnesota 55422.

Saturday show hours are 11:00 a.m. to 9:00 p.m. On Sunday the hours are noon to 5:00 p.m. Admission is $2.50. There will be special demonstrations, lectures, antique ID Clinic and an outstanding door prize.

Special Article

Does Family Practice Work in A Multispecialty Clinic

DAVID L. von WEISS, M.D.*

Family practice can work well in a large multispecialty clinic. Particular advantages and strengths for a Family Practice Department within a multispecialty clinic are evaluated. A department whose main purpose is continuous comprehensive care is the greatest advantage.

IN ORDER TO EVALUATE this question adequately, we will take a historical perspective of the practice of medicine in America. It is important to view exactly how the multispecialty clinic and Family Practice each have developed within that framework.

In 1910, the Flexner Report[1] was issued. This led to reforms of medical education, which sharply upgraded the quality of medicine practiced in America. As pointed out by Janeway,[2] this had an unexpected side effect. With increased medical knowledge, subspecialization has led to ever greater knowledge of smaller and smaller segments of medicine. The result has been a fragmented and compartmentalized health care system.

It was within such a medical setting that the St. Louis Park Medical Center was founded in 1951. The eleven specialists who formed it were dedicated to practicing the highest quality of medicine. Since that time, the group has grown to an organization comprising over 90 physicians.

In 1966, at the request of the American Medical Association, the Millis Commission Report[3] was issued. It found an appalling dysfunction of health care delivery in the United States and pointed out the lack of continuity and comprehensiveness of care provided to the individual patient. It recommended the development of a new kind of physician, the primary physician. It was from this recommendation that the Family Practice specialty arose. Doctor Millis emphasized that the intent here, of the primary physician, was not the physician of first contact or triage physician, but the physician who would assume continuing and comprehensive care for problems simple and complex.

The St. Louis Park Medical Center shortly after this evaluated its own pattern of health care delivery, and likewise, found a need for adjustment in its pattern of primary care. To address this problem, the Department of Family Practice was founded in 1969.

At that time the Department comprised two Family Practice doctors who cared for 3% of the Clinic's outpatients. In the ensuing seven years, the Department has flourished and there are now nine Family Practice doctors, caring for 13% of the Clinic's outpatients. The Department is based at the main clinic and in three satellite offices. It forms part of a multi-specialty group of 90 doctors. Simultaneously, the University of Minnesota has based an affiliated Family Practice Residency section at the Clinic. The effect of the residency on our Clinic is apparent. The teaching has benefited both the Clinic doctors and the residents. Such is our Family Practice Department in this multispecialty clinic.

Now, does it work? To answer this question I have tried to view it from three positions; the point of view of the patient, of the multispecialty clinic itself, and of the Family Practice doctor. First of all from the patient's point of view, it should work quite well. The Family Practice doctor is specifically oriented to satisfy the needs of the individual patient who, as it were, faces the monolith of the large, multispecialty clinic. He is not only the doctor who can handle 95% of his patient's medical problems, but also, as pointed out by Draper and Smits,[4] serves his patient as a manager, ombudsman, educator, and counselor.

He acts as manager when he mobilizes the assistance of the specialists in a manner to best benefit the patient, as well as when he guides his patients to the appropriate paramedical professionals, social services and community resources. He is an ombudsman for the patient who is unfamiliar with the specialized technical science which is modern day medicine. For example, when the surgeon and oncologist are pursuing ever more therapeutic endeavors, it is often the primary physician who may best argue for the patient, his right for an end to heroics, and a death with dignity. The role of educator is probably the primary physician's most important one. Medical science has brought us to the point where the most common causes of death are best handled by prevention rather than cure. The primary physician must be a real salesman to sell such values as wearing seat belts, avoiding drug and alcohol abuse, as well as selling the need for faithfully taking antihypertensives, and maintaining good diabetic control. Lastly, the primary physician is a counselor, by being available when the patient needs him. He is, in some way, close to the patient at the critical times of his life: birth, physical illness, emotional decompensation and death. By his involvement, continued presence, and human concern, he gives support and counsel to his patients.

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*Department of Family Practice, St. Louis Park Medical Center, Minneapolis, Minnesota.

As the Family Practice Department has grown, patients are, in fact, identifying us with these roles. Patient satisfaction appears quite good. When new enrollees in our HMO plan were offered the choice of a family practitioner, a pediatrician, an internist, or an obstetrician as their primary doctor, over half requested a Family Practitioner.

The second viewpoint is that of the multispecialty clinic itself. Specific advantages to the clinic include the presence of a department that is able to meet the common needs of most patients and families. Acquaintance with several members of a family over a period of time gives the family practitioner a great advantage in dealing with the emotional components of health problems. Other services to the clinic include episodic and emergency room care, and occasionally assisting the surgical subspecialists in perioperative care. The Family Practice Department is uniquely able to assist overloaded departments (specifically Orthopedics and Neurology in our case) by managing many of the problems and referring only the complex situations.

Theoretically, a strong primary care department should be more satisfying for the specialist because it frees him to devote more time to his particular field of interest. In 1976 alone, Family Practice will generate more than 1500 screened referrals for our Clinic specialists.

A primary care department provides an essential base for a prepaid HMO such as the one recently established at the St. Louis Park Medical Center. The primary doctor is necessary to guide HMO patients in their medical care and direct referrals, or to prevent over or underutilization of Clinic facilities.

From a financial point of view, the Family Practice Department pays its own way, and it is probably the most cost-effective way for a multispecialty clinic to run a satellite office, although we are still gathering data in this area. In theory, referrals should work better since a good Family Practice doctor adequately prepares and educates the patient for the referral process.

The last vantage point is that of the Family Practice doctor who works in the framework of a large clinic. He will identify many positive aspects. There is a ready supply of patients and the confidence of an easily predictable, reliable referral pattern. The managerial headaches of bookkeeping, personnel work, accounting, purchasing, and billing are all relegated to nonphysician personnel. There can be the security of a predictable income and the numerous fringe benefits available to a larger group. Probably more important to us is the ready access to the many subspecialists available for "curbstone" consultation, as well as for regular referral. This plethora of specialists creates a more stimulating environment. The numerous conferences held in many fields of medicine help keep the Family Practice doctor abreast of new changes in his profession.

At this time, the present group of Family Practitioners is quite new at the St. Louis Park Medical Center. Seven of its nine doctors have joined in the past three years. We must remember that it takes time to build a true Family Practice, whether in a big clinic or in solo practice. It takes time for the patient to know and understand the doctor, time to build trust so that the Family Practitioner can most effectively help the patient. This is probably more true in large multispecialty clinics which, by virtue of size alone, tend to resemble the impersonal business world. It will probably be a few more years before we would expect the doctors of our Family Practice Department to operate at peak effectiveness. The picture I have tried to present is the transition of a totally specialty-oriented clinic that expanded its interest in primary care. In pursuing this interest, it chose Family Practice as one avenue of providing primary care. Family Practice is working and will work even more effectively in the future.

There are, however, several challenges inherent for the Family Practice in a multispecialty clinic. First of all, it is imperative that the overall concept of health care delivery by the multispecialty group be patient oriented. This requires the presence of a clearly defined, strong, primary care department. Probably each clinic patient should be identified with a primary physician from one of the primary care specialties.

Secondly, the role of Family Practice in relation to the other primary care specialties of Obstetrics, Pediatrics, and Internal Medicine must be better defined to allow growth for each. Neither should feel that it is the ultimate in providing primary care. Presently the boundaries of our specialty are a little fuzzy. With time and growing experience, we would anticipate a clearer definition of Family Practice and a better understanding of its unique contributions as a primary care provider.

Thirdly, adequate recognition and reward must be given to the primary care doctor. This includes the need for the value and respect of his subspecialty colleagues. This will be a natural consequence as the Family Practice Department grows in performance and makes increasing contributions to the Clinic.

In the final analysis, we consider that Family Practice is progressing steadily, learning new things, and is gradually achieving its full potential as a specialty within the multispecialty clinic. It is clearly past the experimental stage and is now seen as an integral part of our medical practice.

References

1. Flexner A: Medical Education in the United States and Canada (Bulletin No. 4). Carnegie Foundation for the Advancement of Teaching, 1910.
2. Janeway CA: Family Medicine—fad or for real? New Engl J Med 291:337, 1974.
3. Millis JS: Report of the Citizens Commission on Graduate Medical Education, Council on Medical Education. Chicago, American Medical Association, 1966.
4. Draper P and Smits H: The primary care practitioner—specialist or jack of all trades? New Engl J Med 293:903, 1975.

MINNPAC

A massive recruitment drive for new MINNPAC members has been announced by MINNPAC Chairman, Richard E. Engwall, M.D. The drive will be concentrated during a one-month period from May 23 to June 23.

Appearing before the MSMA Council at its April 16 meeting, Dr. Engwall reported that steadily dropping MINNPAC membership "must not only be a concern to the MINNPAC Board but also to the Council and medical leadership of the Minnesota State Medical Association." A special MINNPAC Planning Committee has prepared a report with recommendations designed to reverse the membership trend and bring it in line with most other state PACs and AMPAC which have shown a steadily increasing membership curve over the years.

The special MINNPAC membership drive will depend heavily on the volunteer work of auxiliary members in each of the county medical societies in Minnesota. The objective will be to meet "eyeball-to-eyeball" with each and every physician and physician's spouse who have not joined MINNPAC to date. Special materials are being designed to help volunteers proceed with the recruitment drive and aid physicians in joining MINNPAC and AMPAC.

A key part of the goal of increasing MINNPAC membership will be the involvement of MSMA leadership. The MSMA Council took action to hold a joint breakfast meeting with the MINNPAC Board on Thursday, May 19, 1977 during the MSMA Annual Meeting.

Editor's Note: MINNESOTA MEDICINE will carry in the next issue, a special interview with MINNPAC Board Chairman, Richard E. Engwall, M.D

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- Effectively controls susceptible pathogens such as *E. coli, Klebsiella-Aerobacter, Staph. aureus, Proteus mirabilis* and, less frequently, *Proteus vulgaris*.

*nonobstructed, due to susceptible organisms

Before prescribing, please consult complete product information, a summary of which follows:

Indications: In adults, urinary tract infections complicated by pain (primarily pyelonephritis, pyelitis and cystitis) due to susceptible organisms (usually *E. coli, Klebsiella-Aerobacter, Staphylococcus aureus, Proteus mirabilis,* and, less frequently, *Proteus vulgaris)* in the absence of obstructive uropathy or foreign bodies.

Note: Carefully coordinate *in vitro* sulfonamide sensitivity tests with bacteriologic and clinical response; add aminobenzoic acid to follow-up culture media. The increasing frequency of resistant organisms limits the usefulness of antibacterials including sulfonamides. Measure sulfonamide blood levels as variations may occur; 20 mg/100 ml should be maximum total level.

Contraindications: Children below age 12; sulfonamide hypersensitivity; pregnancy at term and during nursing period; because Azo Gantanol contains phenazopyridine hydrochloride it is contraindicated in glomerulonephritis, severe hepatitis, uremia, and pyelonephritis of pregnancy with G.I. disturbances.

Warnings: Safety during pregnancy not established. Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been reported and early clinical signs (sore throat, fever, pallor, purpura or jaundice) may indicate serious blood disorders. Frequent CBC and urinalysis with microscopic examination are recommended during sulfonamide therapy.

Precautions: Use cautiously in patients with impaired renal or hepatic function, severe allergy, bronchial asthma; in glucose-6-phosphate dehydrogenase-deficient individuals in whom dose-related hemolysis may occur. Maintain adequate fluid intake to prevent crystalluria and stone formation.

Adverse Reactions: *Blood dyscrasias* (agranulocytosis, aplastic anemia, thrombocytopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia); *allergic reactions* (erythema multiforme, skin eruptions, Stevens-Johnson syndrome, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis); *G.I. reactions* (nausea, emesis, abdominal pains, hepatitis, diarrhea, anorexia, pancreatitis and stomatitis); *CNS reactions* (headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo and insomnia); *miscellaneous reactions* (drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon). Due to certain chemical similarities with some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia. Cross-sensitivity with these agents may exist.

Dosage: Azo Gantanol is intended for the acute, painful phase of urinary tract infections. *Usual adult dosage:* 2 Gm (4 tabs) initially, then 1 Gm (2 tabs) B.I.D. for up to 3 days. If pain persists, causes other than infection should be sought. After relief of pain has been obtained, continued treatment with Gantanol (sulfamethoxazole) may be considered.

NOTE: Patients should be told that the orange-red dye (phenazopyridine HCl) will color the urine.

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* WARNING
This fixed combination drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual patient. If the fixed combination represents the dosage so determined, its use may be more convenient in patient management. The treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* **Indications:** When the fixed combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium-sparing action of its 'Dyrenium' component is warranted.

Contraindications: Further use in progressive renal or hepatic dysfunction; hyperkalemia. Preexisting elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs. Routine use of diuretics in otherwise healthy pregnancy.

Warnings: **Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired.** If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in severely ill patients with urine volume less than one liter/day, the elderly or diabetics, with suspected or confirmed renal insufficiency. Periodic determinations of serum K^+ should be made. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **The presence of a widened QRS complex or arrhythmia in association with hyperkalemia requires prompt additional therapy.** Thiazides are reported to cross the placental barrier and appear in breast milk; fetal or neonatal hyperbilirubinemia, thrombocytopenia, altered carbohydrate metabolism and other adverse reactions that have occurred in the adult may result. When used in pregnancy or in women who might bear children, weigh potential benefits against possible hazards to fetus. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics, or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving Dyrenium® (triamterene, SK&F Co.), and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Do periodic blood studies in cirrhotics to check for nondrug-related variations in blood pictures, and in patients with folic acid depletion, since 'Dyrenium' may contribute to appearance of megaloblastosis. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

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Editorials

St. Louis Park Medical Center

Twenty-Five Years of Service to the Community

In the early post World War II years there were many physicians in training programs who were faced with the decision of remaining in academic medicine as teachers and investigators, or of going into practice. The lure of the ivory tower was great, but many had strong urges to care for patients on a broader scale than was possible in institutional practice. A good compromise was to enter practice in a group of similarly motivated individuals combining the intellectual stimulation and discipline of academia with the satisfactions of medical care in a private setting.

The St. Louis Park Medical Center owes its origin to this kind of thinking among a group of residents and junior staff members of University of Minnesota affiliated hospitals who became the founding members of the Medical Center.

Group practice at that time (1951) was not as widely accepted as now. Although there was strong support from colleagues at the University, and some in private practice, there was also widespread antagonism to such a group of young "pinkos" (as we were designated by a leading Minneapolis internist) entering practice in such an audacious fashion. Failure of the venture was enthusiastically and, by some, gleefully predicted. Hospital staff memberships were difficult to come by except that Mt. Sinai Hospital, which opened the same year, welcomed the whole group to staff membership initiating a professionally rewarding relationship. This lasted until Methodist Hospital moved to St. Louis Park, at which time major hospital activity of the clinic members shifted to Methodist.

The objectives of the clinic were to be of service to the community, to provide quality medical care, and to make contributions in medical research and education. It remains our belief that we can accomplish these objectives best in group practice. We have tried to maintain a high standard of achievement by continuous quality control as a built-in discipline, and by recruiting the best available physicians as the demands of our practice grew. Members of the clinic serve on the staffs of many of the city's private hospitals and most have clinical teaching appointments at the University of Minnesota with a wide variety of teaching activities at the University, Veterans Administration and Hennepin County Medical Center. In addition, several serve as preceptors for residents in surgery, obstetrics, gynecology and medical oncology in the private hospitals. The clinic has provided supervision of training in the first (hospital) and in the second and third (outpatient clinical) years for residents from the University family practice program. This was possible because of the development of a large family practice department, one of the first such in an otherwise exclusively multispecialty clinic.

The Health Services Research Center operating within the structure of the St. Louis Park Medical Center Research Foundation is currently using the clinic as a laboratory for a major study of Quality Assurance Programs. The information in this study will be available to assist other clinics and groups in setting up similar programs in this critical and soon-to-be compulsory area.

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A more controversial and yet forward-looking development undertaken by the clinic was sponsorship of a prepaid health program known as Medcenter Health Plan. This HMO has an expanding membership and has demonstrated that the private sector is capable of providing alternative methods of health care successfully.

The development of small satellites in suburban areas has been looked upon as recognition of the natural and expanding development in current medical practice of bringing primary care capability closer to the homes of our patients.

At 25-years-of-age the Clinic, now expanded from 10 to 90 physicians, has become an established fact of life in Minnesota medical practice with effective working relationships with many of our colleagues in practice, with the hospitals to which we bring our patients, and with other medical groups throughout the country. The programs referred to above are best seen in the light of developing new ways of providing consumer-oriented quality care. The salvation of the private practice of medicine and its ongoing efforts to provide alternatives to government intervention may well be through efforts such as these.

The first 25 years went very quickly. There have been exciting changes in medicine during that time. Who knows what the next 25 will bring? The papers in this issue of MINNESOTA MEDICINE reflect in some measure the work of the St. Louis Park Medical Center staff and are offered in the spirit of sharing what we have learned from our practice with the readers of this journal.

Robert A. Green, M.D.
St. Louis Park Medical Center
Guest Editor

Management of Hip Fractures

DR. DE SOUZA* HAS given us an interesting review of some of the problems in the management of fractures of the hip. As he points out, it is important to be aware of the difference between the intertrochanteric fracture and the intracapsular, or femoral neck, fracture. Even though these two injuries are rather closely related anatomically, treatment and prognosis are vastly different. The major difference in treatment is that anatomic reduction is not quite as necessary in intertrochanteric fractures, but securely stable fixation is very important. In the femoral neck, or intracapsular, fracture, the problems of non-union and avascular necrosis are relatively common, whereas these problems are quite rare in intertrochanteric injuries.

The anatomic, or as the author phrases it, "normal alignment," reduction has been found to be the best method of reduction in the intracapsular fracture. Formerly, it was thought that perhaps a valgus reduction would be beneficial, but that has proven false.

It is mentioned in the article that if one cannot obtain a normal alignment reduction, it is relatively easy to do an open reduction to obtain good position. In my experience an open reduction has not been an easy way to obtain anatomic alignment. If one cannot obtain an anatomic reduction by closed methods, perhaps a prosthetic replacement is better. It is certainly better, of course, than accepting a poor reduction.

Dr. De Souza states that in fixation of intracapsular fractures a collapsing screw device would be superior to the collapsing nail because it provides compression at the fracture site. It does not appear that the screw actually provides compression, but the fact that the device is collapsible allows compression to result from normal muscle pull against the femoral neck. This is true, of course, with the collapsing nail as well as with the screw. Both devices have the important advantage of allowing collapse at the fracture site. One advantage of the screw, however, may be that it is less likely to back out of a severely osteoporotic femoral head. On the other hand, insertion of the nail is somewhat easier.

Garden's classification of fractures of the hip has proven quite useful in predicting prognosis. Another useful observation made by Garden is his recommendation of the use of a low angle of fixation. The nail placed at 150 degrees provides much better stability than one placed at 135 degrees. Low angle fixation combined with an anatomic reduction seems to have resulted in a reduced incidence of non-union and avascular necrosis since the Massie nail has been used widely in the Twin Cities area.

Stability is the most important aspect of fixation in the intertrochanteric fracture. It is sur-

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*See page 339.

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prising how versatile the sliding nail at 150 degrees has become even in the most comminuted intertrochanteric fractures. This device has reduced our incidence of complications in these fractures, whereas it would seem that in other parts of the country complications are more frequent, as evidenced by the numerous articles illustrating difficulty maintaining fixation in the intertrochanteric fracture. An example is that people are still recommending medial displacement osteotomy in intertrochanteric fractures. In some cases it appears that this has been done even in relatively stable fractures. In most intertrochanteric fractures medial displacement, or an osteotomy to obtain medial displacement, is neither necessary nor recommended.

As Dr. De Souza states, this is still an injury which can result in significant complications and we do not as yet "have all the answers." We are, however, making progress toward a better prognosis for patients with this injury.

Joseph M. Tambornino, M.D.
Minneapolis, Minnesota

Multiple Urinary Tract Infection

Doctors Blackard and Anderson* have presented a model for the patient likely to reinfect after treatment for a urinary infection. She is over forty and has a history of previous infections. Her culture will likely show organisms other than E coli or is mixed. She may have other significant medical problems including urologic disease. The authors wisely alert us to closer followup with this individual.

The estimated annual cost of urinary tract infections of $20 billion is a staggering one for this country. Since urine is such an excellent culture medium and just the right temperature for bacterial growth, perhaps we should wonder why more individuals do not develop urinary infections. Certainly the mechanical washing action of urine and the complete emptying of the system are factors that help protect us from infection.

We would do well to encourage our patients in good bladder habits, e.g.:

1. To avoid postponing voiding since an overstretched muscle contracts poorly.
2. To maintain an adequate fluid intake. A surprising number of individuals drink no water as such; in fact, indicate their dislike for it.
3. Adult females should be made aware that bacteria can be forced into the proximal urethra or bladder during intercourse or insertion of a tampon or vaginal medication. Obviously, they are more comfortable if they void before these events, but they should also urinate as soon as possible afterward.

Gerald W. Koos, M.D.
Minneapolis, Minnesota

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*See page 319.

Prognostic Significance of Chest Pain

Chest pain is a common complaint bringing patients to the office of the primary care physician. Clearly, not all patients presenting with chest pain need to undergo coronary arteriography. Peterson's paper* presents data to aid in the selection of patients for coronary arteriography. Conversely, data is presented suggesting groups of patients with chest pain for whom coronary arteriography need not be recommended.

Clearly, patients with Class III and IV or angina and with a positive exercise electrocardiogram should have coronary arteriography recommended to them. Conversely, patients with stable, atypical and minimal chest pain coupled with a normal exercise electrocardiogram, usually do not need coronary arteriography.

The author is to be congratulated for careful analysis of a wealth of clinical information (680 consecutive patients). Data of this kind provides a rational basis for selection of patients for coronary arteriography.

Theodore A. Peterson, M.D.
Minneapolis, Minnesota

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*See page 303.

News Bulletin

MOST PHYSICIANS AFFECTED BY NEW F.D.A. RULES ON HEARING AID DEVICES, commencing August 15, 1977

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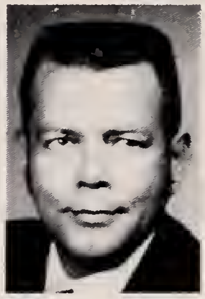

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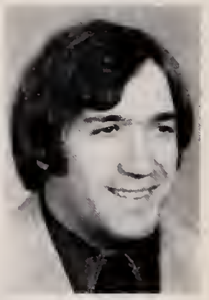

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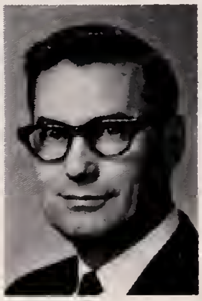

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Brief Synopsis of FDA Rules affecting the physician:

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Metastatic Cancer Involving The Central Nervous System

Aggressive management of metastatic lesions to the brain is an often overlooked and criticized phase of management of the cancer patient. Frequently, a patient with metastatic involvement of the brain with minimal involvement elsewhere is treated supportively with no thought to aggressive management of the lesion within the brain.

Recent studies indicate that possibly one-third of the lesions seen in the brain are solitary. Of these, many are amenable to surgical removal. The selection of the patient for surgical removal of brain metastasis requires an overall evaluation of the patient's general clinical status, systemic tumor burden and projected prognosis.

The patient who presents with a metastatic lesion as the initial presentation from a primary lesion external to the central nervous system frequently benefits greatly from aggressive early management of the solitary brain metastasis. Appropriate studies to determine that the lesion is indeed solitary are indicated. Frequently, the primary lesion cannot be determined prior to examination of the histology of the brain lesion and sometimes is unidentified even with that histologic examination available. Surgical removal alone may suffice in some cases, whereas in others, surgical removal plus total cerebral radiation is the preferred approach.

Even though the patient may ultimately succumb to systemic malignancy, the quality of the patient's life and performance level may be greatly improved by aggressive attention to cerebral metastasis. In the case of certain lesions, such as cancer of the breast, treatment of the brain with radiation even in the face of a fair amount of systemic tumor burden may produce excellent results, in terms of functional capacity and quality of life.

The case described by Dr. Shapiro* in last month's issue of Minnesota Medicine attests to the general improvement in activity which can be accomplished by aggressive treatment in cerebral metastasis. The terminal event in this patient was not associated with recurrent tumor and the accentuation of her previous neurologic deficits attributable to the metastatic disease is undoubtedly due to hypercalcemia. Hypercalcemia is known to accentuate prior neurologic deficits seen as a result of stroke or other central nervous system damage, and I think this case is an example of that. The neurologic symptomatology not associated with her original metastasis would appear to be rather typical of subacute cerebellar degeneration, although this was not confirmed by histologic evidence.

In managing the patient with cerebral metastasis and known systemic carcinoma, one must consider the total tumor burden and prognostic outlook in relationship to the treatment to be undertaken. With the presence of systemic disease in an amenable lesion, radiation therapy to the cerebrum without surgical intervention can be quite beneficial. Multiple lesions in the brain are no contraindication to the cerebral radiotherapy and this modality should be considered in patients with such disease. The isolated nodule, particularly in the patient with no other known tumor burden or with minimal tumor burden and good prognostic outlook, becomes a candidate for surgical removal of the isolated nodule and consideration of post-surgical radiation therapy to the brain depending upon the histologic nature of the lesion.

John H. Brown, M.D.
Minneapolis, Minnesota

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*Shapiro, Sidney K.: Metastatic and Nonmetastatic Involvement of the Nervous System Complicating Cancer. 60:4:236, 1977.

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Interviews

An Interview with Dr. G. Roy Diessner

Past President, Minnesota State Medical Association

Interviewer: *A year has passed since you were President of the Minnesota State Medical Association. Looking back, what stands out in your mind about your tenure?*

Dr. Diessner:

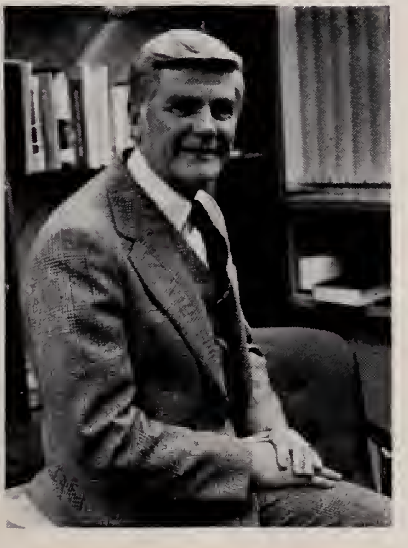
I believe disappointments rather than any successful events linger longer. At this time when the legislature is in session, I am reminded again how frustrated I felt throughout the year of my presidency with my inability to influence the legislators to do something worthwhile to help solve the complicated problems of professional liability. I felt frustrated that the legislators had not really understood our presentations.

However, it was an educational experience to testify at legislative hearings and discover how legislators viewed the practice of medicine. Their views were not the same as mine.

Interviewer: *Maybe this different view had something to do with your background, i.e. your clinical experience at Mayo? Do you think you see things differently because you practice at the Mayo Clinic rather than practicing on the outside?*

Dr. Diessner:

No, I think at Mayo we have a few different concerns, but we have many common concerns too. The aspects of group practice and educational institutional practice are sometimes unique, but basically, I feel the same view of medical practice is shared by most physicians regardless of their type of practice.

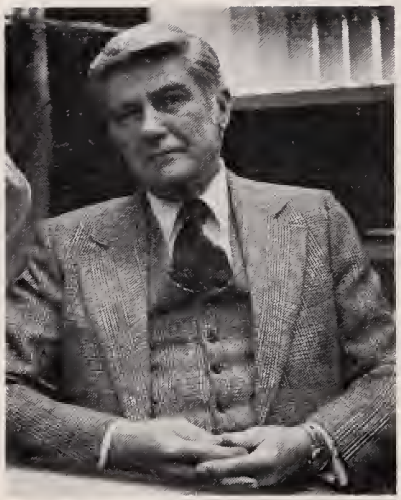


Interviewer: *As the Association's chief representative, did you feel organizations representing private medicine had any power to influence national legislation? Perhaps I should put the question in the present tense: do you feel we can help shape health legislation?*

Dr. Diessner:

We can't change laws that have passed, but we can change those that are being drafted as the proposed legislation is being discussed. During the drafting and debating process we have our greatest input. We have to be in the arena when laws are being drafted.

Interviewer: *Do you think the AMA made the proper decision when they introduced their own national health insurance bill?*



Dr. Diessner:

Yes, I do. We now have a position to work from. You just can't go in and say: we oppose this, we oppose that. You must deal from strength. If you don't have a concrete proposal, you are not addressing the problem. Obviously, we should have a position on most everything that relates to health. If not there is something wrong.

The AMA made a serious error, I think, when they did not participate in early discussions and drafting of the planning bill. Their strategy, I was told, was not to enter into discussions because they felt the proposed legislation was unwise. They wanted to challenge it in court later. So they decided not to participate.

Now, legally this may be a good position, but I believe it's wrong for medicine to adopt that attitude. You should be cooperative, then you have to get in there, and present your programs on their merit, whether they are accepted or not. A positive attitude is essential. If you close the door before you even enter into the discussion, don't complain about ultimate results. You are destined for disappointment.

Interviewer: *Because of the Country's economic distress, the bad winter, the drought in the West, most observers now feel the Carter administration will not even get a bill on the floor until 1978. Do you agree with that assessment?*

Dr. Diessner:

From all I read and all I hear, I think this is accurate. It is not coming from one source; it is coming from many sources. We may be getting some piecemeal legislation at this point, part of the push for the National Health Insurance Bill which will come eventually. For example, we might add children up to 18 to the Medicare Program, or there may be increased benefits for the older age group.

Interviewer: *Will a bill for treating catastrophic illness precede the National Health Insurance Bill?*

Dr. Diessner:

Not necessarily. Such benefits are more likely to be part of a national health insurance bill.

Interviewer: *What is the State Legislature going to do this year? What bills will they try to pass? What is the most important one?*

Dr. Diessner:

Well, I hope they will address the issue of professional liability and malpractice and take up the proposals that we have suggested

and act favorably on them. I think that would be good, but they are probably not going to address this problem at all. And there is a strong possibility nothing will happen. In spite of the Governor's message, there are just so many dollars to go around, and there are concerns about starting new programs.

Interviewer: *What about hospital based physicians? Do you envision the Legislature passing a bill placing these specialists on hospital salaries or otherwise drastically altering their contractural arrangements with hospitals?*

Dr. Diessner:

I have heard very little about it. As you know, in the last Legislative Session, and particularly before this session, there was a great deal of discussion about hospital based physicians. If there is now something afoot, I am not aware of it.

Interviewer: *In your departing address as President, a "Challenge to Health Care Cost Containment," which was published in* MINNESOTA MEDICINE, *you said controlling costs was the fundamental issue facing the medical profession, and the profession should take a lead in containing costs. Do you still feel that way a year later?*

Dr. Diessner: Even more strongly.

Interviewer: *In that article you suggested five possible solutions for containing health care costs. These were: (1) to give present programs the chance to work; (2) to get together responsible leaders of labor, industry, and insurance to reform wasteful insurance practices; (3) to emphasize programs of health education and preventive medicine; (4) to curtail appropriation of large sums of money for single diseases; and (5) to establish a nonpolitical National Health Council to establish priorities, directions, and goals.*

Perhaps you can comment on these now. First, you suggested the Government give present programs, such as PSRO, a chance to work. Do you still feel that is reasonable?

Dr. Diessner:

Yes, I do. We all would like to modify existing laws, but once you start tinkering, you tend to over-tinker. I would like to see the present programs given a chance to be adequately funded, and see what happens. When we have had a chance to see how they work, then make suitable changes.

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*59:8:557, August, 1976.

Interviewer: *Your second possible solution was this: you said responsible leaders of labor, industry, and the insurance industry ought to be given a chance to suggest changes in health insurance coverage. You mentioned first dollar coverage and reinstituting the concepts of deductibles or co-insurance so that individual patients would be aware of his stake in health cost. Has any progress been made?*

Dr. Diessner:

To my knowledge there has been no progress. Labor is opposed to this concept. Yet, many physicians looking at costs would think that this is a logical approach.

Many of the health care costs, the individual must indirectly pay are costs that he doesn't realize. He doesn't get the total bill. Or if he does, he sends it on to his union or to his employer, and the patient pays relatively little or nothing at all. As time passes, patients pay less and less directly, and costs go up and up. Still, union leaders say that "no way" is there going to be any elimination of first dollar coverage. They want workers shielded from any direct payment.

Interviewer: *What about management? Management, you stated, was beginning to favor a national health bill, because health care costs are creating a drain on their profits. Previously management has sided with medicine. But they are shifting their stance because of runaway inflation. Do you agree?*

Dr. Diessner:

Yes, I do. I think it is even more true than it was a year ago when I made this statement. You see articles in print now in magazines and reports from Washington, where the automakers are challenging government and medicine to do something about the escalation of health care costs. Costs are so high their profits are threatened.

Interviewer: *I read health care costs for autoworkers run $250 per car.*

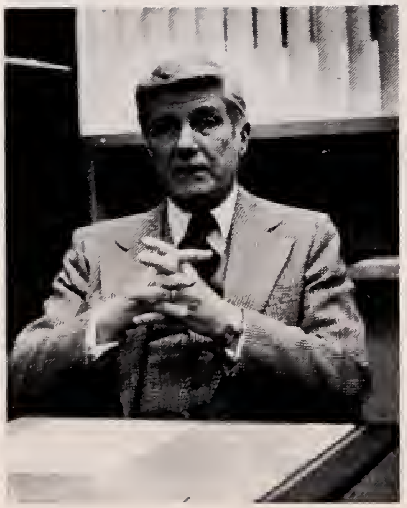
Dr. Diessner: **Yes.**

Interviewer: *What about your third suggestion: improving health education. How can physicians become leaders in bringing that about? Or is that a problem the mass media should solve? What about public education programs? Do you have any ideas about how we might become more effective in getting people to cut down smoking, reduce drinking, lose weight, fasten safety belts, and exercise?*

Dr. Diessner:

A complicated question. Physicians can't do it alone.

There is no question about that. It has been shown in the drive to ban smoking. You can advise people what is best for them, but



we are free people and we can do what we want to. Health Education will require more than physicians; it will require the help of the media, advertising people, the educational system, and industry. You can't force people to behave.

People have to establish priorities. Housing is important. Some people who have inadequate housing have fancy cars. They prefer to use their money in this way. I think it is very difficult for anyone to control behavior. Public education is important. It is not only the physicians. The media is involved. All of our agencies in government are involved in trying to educate people, but at the same time you have to understand that you are not going to educate all.

We have our differences and what we consider our priorities, and I don't think you can legislate that for people as long as you have a free society. You are always going to have some who are not going to do what is best for themselves.

Interviewer: *President Carter has emphasized preventive medicine. What do you think he means?*

Dr. Diessner:

I am not sure. We have had preventive medicine around for a long time. All of us practice this, every practicing physician, every day. You hear more about this from legislators. Carter has adopted the term, but I'm not sure he knows what it means. The idea came out of health maintenance organizations. You are supposed to prevent illnesses, and this was to be the answer to our medical cost problems and the overuse and all the rest of it.

Preventive medicine, or preventive maintenance, is not the total answer by any means to the problems we face today, and I think it has been over-emphasized primarily by the people in government.

Interviewer: *How can physicians reduce medical costs?*

Dr. Diessner:

Well, there are many things we can do right now. You probably know that the Council of the Minnesota State Medical Association is trying to get leaders of labor, industry and the insurance people in Minnesota together to talk about this. Maybe there is something we can do right here in Minnesota. We ought to try.

Interviewer: *In your concluding address last year, you also mentioned we should pre-examine the value of pouring huge amounts of money into specific disease areas. You questioned the wisdom of this. I am sure you still feel the same.*

Dr. Diessner:

I feel the same way, but the problem has gotten worse. I am a rheumatologist, and now there has been an arthritis act which proposes we spend millions to wage war on arthritis. Diabetes is another disease against which we shall declare war. You don't eliminate diseases by throwing federal money at them.

I think this is terribly unwise, and I think it is bad, not that I am against the cure of cancer or the cure of heart disease or the cure of renal disease, but appropriating and designating federal money for campaigns against single diseases is the wrong way to go. It is detrimental. We are getting more and more of this . . . The Disease of the Year. We will now appropriate so much for multiple sclerosis . . . next year it might be something else.

Interviewer: *During your year as President the press picked up at least three or four of your President's Letters and gave them wide publicity, including a piece in* VARIETY, *the show business magazine. Do you think the press is becoming more sympathetic to medicine?*

Dr. Diessner: **That is a difficult question.**

Interviewer: *That is a masterly evasive answer. Tell me, do you think the State Association should have a regular column in one of the metropolitan papers to present our views?*

Dr. Diessner:

I don't think I have ever heard of anyone suggesting a regular column in a public newspaper. I don't know how effective this would be. I think it might be better not to have a regular column in the paper. If something we say or do is worthwhile, educational to people, the press will pick it up even if it isn't sensational or something that is going to sell papers.

Interviewer: *Many physicians don't share your sanquine view of the press. Indeed, the medical profession is upset because their positive positions rarely get before the public. The press filters out the good, leaving a residue of greed, scandal, and narrow self-interest. Even though the State Association has hired a Communications Director, many physicians still feel the press fails to give a balanced view.*

Dr. Diessner:

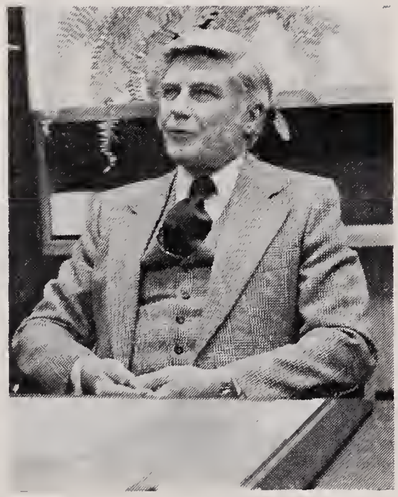
They do tend to publicize scandals and to suggest that the whole profession is at fault. An example is the Medicare-Medicaid scandal. Perhaps we need to "educate" the press.

Interviewer: *Do you consider the Federal Trade Commission's activities against relative fee schedules of anesthesiologists, orthopedists, and its attacks against the specialties and organizations to be concerted effort of the government to subjugate medicine?*

Dr. Diessner:

It is an attack on professionalism. It is not just medicine. Lawyers are also under attack. You and I feel professions should regulate themselves. The Trade Commission feels self-regulation is not enough. This is a re-thinking that all professions are going to have to face. The Trade Commission regards us more as business people rather than as professionals and wants to treat us as businessmen.

Interviewer: *Recently the FTC has subpoened the records of the specialty boards. Do they want to take over certifications of specialists?*



Dr. Diessner:

That, to me, is inconceivable. Who could do this? It would be very difficult to throw out the Boards, the Boards of Internal Medicine, the Boards of Neurology, the Boards of anything. You need regulation, but also, you need competence to be designated a profession.

Interviewer: *The government is trying to democratize medicine by increasing the consumer participation in health planning. This is clear in most in the 1974 Health Services Act, 93-641. Critics of government say this participation is bad for two reasons: (1) the consumers tend to be hostile activists and (2) consumers don't understand medicine. Has that been your opinion that health planning often degenerates into a contest between the liberal activists and conservative physicians?*

Dr. Diessner:

My own experience has not been that at all. I am a member of an HSA Board of Directors in our area, and the consumers on that Board have good knowledge of what is going on. If they don't, they are receptive to being educated. I am distressed when consumers are not active enough. I welcome consumers. I am opposed to having these Boards dominated by consumers, but having consumer input can only be healthy. Our own State Board of Medical Examiners has three consumers on it. The consumers, I understand, have been helpful and have brought information to the Board that has been helpful. We need active participation from outsiders who are willing to listen and to contribute.

Interviewer: *Do you sense a change in the national mood, a shift toward realism in health care that money won't solve all problems? This may be manifested by President Carter's election. He is, after all, a "Conservative Democrat." Don't you think the people are starting to ask hard questions about a national health bill. For example, exactly how much will my payroll taxes increase?*

Dr. Diessner:

Yes, a recent Gallup poll indicated a slackening of enchantment with a national health bill as the only answer. I can't quote the figures, but I was quite surprised. It seems people have increased understanding about what government can and cannot do. I think we will have a National Health Bill, but as a consequence of the long debate these last 20 years, it just may be a reasonable compromise all of us can live with.

Interviewer: Dr. Richard L. Reece.
Photographer: Dr. Farrell Stiegler

Minnesota State Medical Association
Nominating Committee Report Candidates for May Election

The MSMA will hold its election of officers for the coming year at the closing session of the House of Delegates May 20, Radisson South Hotel in Bloomington. The nominating committee, Doctor Paul Blake, Chairman, announced the following slate of nominees:

President Elect
Malcolm M. Fifield, M.D., Duluth
Robert Flom, M.D., St. Paul

1st Vice President
James Flinn, M.D., Redwood Falls
William E. Wellman, M.D., Rochester

2nd Vice President
Glen D. Nelson, M.D., Minneapolis

Secretary
John M. Burns, M.D., St. Paul
Vincent E. Eilers, M.D., St. Paul

Treasurer
Paul S. Blake, M.D., Minneapolis
Joseph A. Cella, M.D., Minneapolis

Speaker of the House
Frederick E. Drill, M.D., Minneapolis
James W. Halvorson, M.D., Zumbrota

Vice Speaker
Severin H. Koop, Jr., M.D., St. Cloud
Robert L. Sauer, M.D., Preston

Natural balance
doesn't always come naturally

Big Balanced Rock, Chiricahua Mountains, Arizona (approx 1,000 tons)

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- **Relief of Nausea and Vomiting**—Antivert/25 can relieve the nausea and vomiting often associated with vertigo.*
- **Dosage for Vertigo***—The usual adult dosage for Antivert/25 s one tablet t.i.d.

BRIEF SUMMARY OF PRESCRIBING INFORMATION

*INDICATIONS. Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

Effective: Management of nausea and vomiting and dizziness associated with motion sickness.

Possibly Effective: Management of vertigo associated with diseases affecting the vestibular system.

Final classification of the less than effective indications requires further investigation.

CONTRAINDICATIONS. Administration of Antivert (meclizine HCl) during pregnancy or to women who may become pregnant is contraindicated in view of the teratogenic effect of the drug in rats.

The administration of meclizine to pregnant rats during the 12-15 day of gestation has produced cleft palate in the offspring. Limited studies using doses of over 100 mg./kg./day in rabbits and 10 mg./kg./day in pigs and monkeys did not show cleft palate. Congeners of meclizine have caused cleft palate in species other than the rat.

Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

Usage in Children: Clinical studies establishing safety and effectiveness in children have not been done; therefore, usage is not recommended in the pediatric age group.

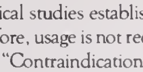
Usage in Pregnancy: See "Contraindications."

ADVERSE REACTIONS. Drowsiness, dry mouth and, on rare occasions, blurred vision have been reported.

More detailed professional information available on request.

ROERIG Pfizer
A division of Pfizer Pharmaceuticals
New York, New York 10017

Antivert®/25



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for vertigo*

Upjohn

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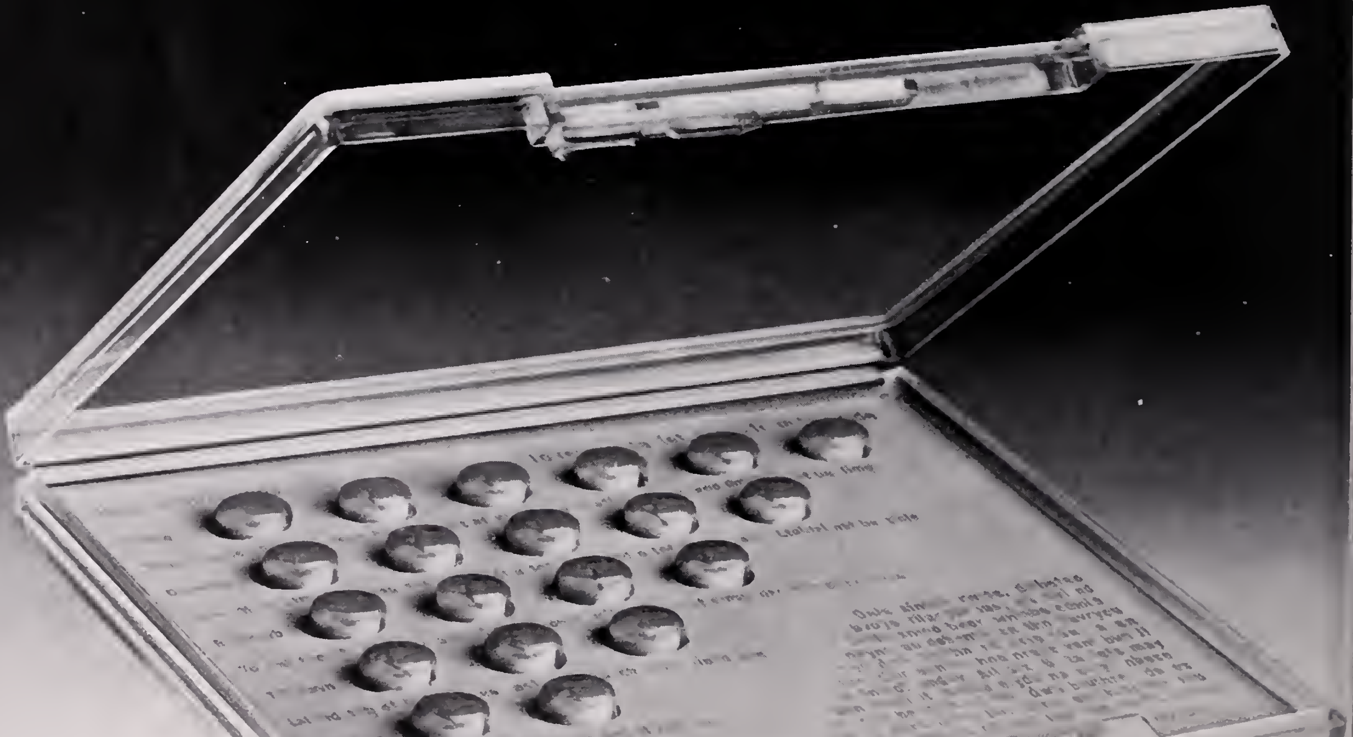
Medrol® 4 mg Dosepak*

methylprednisolone, Upjohn

The explicit printed dosage instructions that accompany each Dosepak make it easy for the patient to understand and follow the dosage regimen.



*Trademark

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Minnesota State Medical Association

124th Annual Meeting

The education segment of the 1977 MSMA Annual Meeting provides a full range of opportunities in the scientific and office management areas. This year's scientific program has 13 different programs. Six offerings will be available on each of the two days in either a morning or afternoon session and the Basic Cardiac Life Support Certification session will be a full day program on Friday.

The 1977 meeting will concentrate on the practice of medicine in the physician's office, and is titled "Doctor's Office Call."

Financial Planning/Malpractice Risk Management sponsored by the Minnesota State Medical Association

The financial planning portion of this session will include a formal presentation and panel discussion reviewing major developments affecting retirement plan management, and discussion of various approaches for meeting the demand for more sophisticated management including a review of E.R.I.S.A., various opinions on the economic and investment outlook, and considerations inherent in prudent selection of professional service providers in the retirement plan service market.

Malpractice risk management will be discussed with an emphasis on those aspects of medical practice behavior that can be modified to reduce the incidence of professional liability claims.

Office Psychiatry for the Primary Care Physician sponsored by the Minnesota Psychiatric Society

This session is planned to present psychiatric problems that may first present to the primary care physician in everyday office contact with his patients—young and old. Thus salient problems such as the reappearing patient with multiple ill defined complaints or patients with chronic pain will be focused on. Depression the ubiquitous finding that may present with somatic findings will be focused on in depth. Defining who is alcoholic and who is not is a first step receding treatment. Binding it all together will be an emphasis on imparting techniques and skills that the psychiatrist has learned to develop toward medical interviewing communicating with and understanding patients.

Office Orthopedics sponsored by the Minnesota State Orthopedic Society

An informal panel discussion with short individual topic presentations on such things as children foot and leg problems, athletic rehabilitation, and the diagnosis and treatment of painful joints. Time will be allowed after each topic for audience participation.

Office Endocrinology sponsored by the University of Minnesota

The course in Office Endocrinology is designed to acquaint the generalist with recent developments which will be helpful to him in patient management. Particular emphasis will be placed on (1) diagnosis and management of thyroid disease, (2) recent advances in diabetes and (3) the current status of oral contraceptives.

Common Dermatoses in Office Practice sponsored by the Minnesota Dematologic Society

Skin problems form a very significant percentage of patients seen in the offices of physicians engaged in primary care. This session is devoted to practical points in diagnosis, and specifics in therapy, of common skin problems seen in the office. There will be time allotted for question and answer interchange, and discussion, between the audience and the faculty. The following will be the topics discussed: Acne Update, Therapy of Warts: Common Rashes in Children; Today's Scabies; What's New and What's True in Dermatologic Therapy and a panel discussion on Diagnosis and Therapy.

Contemporary Office Gynecology sponsored by the Minnesota Academy of Family Physicians and Minnesota Obstetrical and Gynecological Society

Contemporary Office Gynecology will address the following topics: P.I.D.—an Epidemic?; the cervix, its evaluation, preservation and management in positive cytology; and menopause, estrogens and hyperslasia. Emphasis will be on the recent developments and importance of these topics in today's office gynecology.

Ambulatory Surgery sponsored by the Minnesota Chapter, American College of Surgeons

In keeping with this year's State Medical Association's theme various surgical papers have been prepared to enhance and help the family physician and surgeon to deal more effectively in the treatment of the more common (and occasionally complicated) surgical problems seen in office practice.

Allergy in Your Office sponsored by the Minnesota Allergy Society

In keeping with "DOC," members of the Minnesota Allergy Society have prepared current, well illustrated, stimulating and exciting talks on the modern concepts of Allergy practice in the office. There will be some discussion of basic physiology and immunology but only to enhance our understanding of procedures, drugs and treatments used in Allergy practice. There will be ample time for questions and exchange with the program participants as well as Panel discussion. The Panel will address itself to specific questions from the audience as well as to areas of controversy within the practice of Allergy (e.g. steroids, immunotherapy, inhalation treatment).

Good PR Starts in the Office sponsored by the MSMA Public Health Education Committee

A series of presentations to assist individual physicians in developing skills in the fine art of communications—with patients, students and, possibly, the news media. Simulated radio interview, panel discussion of communications techniques and situations, and expert advice on better doctor-patient relations.

Office Urology sponsored by the Minnesota Urological Society

This session will give 20 minute discussions devoted to the following topics: urological history, physical examination and significant laboratory studies and results; enuresis; infertility; significance of hematuria; urolithiasis; and diseases of the prostate. Ample time will be given for questions and answers.

Office Management—Common Pediatric Problems sponsored by the Minneapolis Children's Health Center

Individual presentations concerning problems frequently encountered in pediatric office practice with time for audience participation. Subjects include: Feelings of the Child in the Doctor's Office; The Well Child: How Many Evaluations, Immunizations?; Anemias: When to do blood tests and what do they mean? Teeth: What Physicians Should Look for in the Office in the Routine Exam; An Office Approach to Inguinal Swellings; Management of Children with Recurrent Respiratory Infections.

Time Management for the Physician/The Office Laboratory sponsored by the Minnesota Component Society of the American Society of Internal Medicine

Time Management for the Physician: The presentation should take approximately an hour and ten minutes for questions from the audience. The presentation will cover the following topics: Better Doctor/Patient Flow in the Back Office; Cutting Down on Doctor Interruptions; Getting on Top of Your Office Administrative Tasks; Improved Patient Flow; Controlling Your Practice Day and Practice Week.

The Office Laboratory: Methods, Quality Control, Techniques and Administration. (What can be done well?)

Basic Cardiac Life Support Certification (all day session) sponsored by the Golden Valley Heart Center

The Course will begin with a plenary session reviewing the updated *Standards of Cardiopumonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)* in Basic and Advanced Cardiac Life Support. Didactic presentations in Advanced Cardiac Life Support will briefly discuss life-threatening dysrhythmias, defibrillation, and essential drug therapy in emergency cardiac care.

A Basic Cardiac Life Support (BCLS) Rescuer Course will follow. BCLS includes the following four areas: unwitnessed cardiac arrest, witnessed cardiac arrest, opening an obstructed airway, infant resuscitation. Initial Basic Rescuer certification is based on a passing grade on the cognitive test and perfection in the performance examination for an unwitnessed cardiac arrest in an adult. If time permits, participants may also take the performance examinations for witnessed cardiac arrest, opening an obstructed airway and infant resuscitation. Participants will have an opportunity for manikin practice prior to the actual certification performance. Attendance will be limited.

Since certification is based on both a passing grade on the cognitive test and a perfect score on the performance examination, registrants for this course should recognize that preparation will be necessary prior to the actual session on May 20. A packet of information will be mailed to course registrants 30 days in advance.

All advance registration must be received by the MSMA office no later than May 12.

Late arrivals at scientific sessions will not be permitted after 30 minutes, by directive of the Subcommittee on Scientific Assembly.

Any other questions should be directed to:

MINNESOTA STATE MEDICAL ASSOCIATION
Annual Meeting Registration
101 East Fifth St., Suite 900
St. Paul, MN55101
(Phone—612 222-6366)

Dr. Reuben Berman Wins Annual Bolles-Rogers Award

Dr. Reuben Berman, a Minneapolis internist and cardiologist and Editor Emeritus of MINNESOTA MEDICINE was named winner of the Charles Bolles-Rogers Bowl recently.

The award is given annually to the doctor "who, in the opinion of the Hennepin County Medical Society by reason of his professional contribution on the basis of medical research, medical achievement or leadership, has become the outstanding doctor of this or other years."

Dr. Berman is the 23rd recipient of the award since 1952. A native of Minneapolis, Dr. Berman received his medical degree from the University of Minnesota in 1933. After serving his residency and internship at the old Hennepin County General Hospital, Dr. Berman entered private practice in internal medicine and cardiology.

Dr. Berman became involved in heart research in the early 1950's. He has been the prinicipal or co-investigator in several significant heart research projects at Mount Sinai Hospital in Minneapolis and other institutions. Currently, he is working on hypertension and aspirin myocardial infarction studies.

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Each tablet contains 130 mg theophylline, 24 mg ephedrine hydrochloride, and 8 mg phenobarbital.

Each tablet contains 180 mg anhydrous theophylline (90 mg in the immediate release layer and 90 mg in the sustained release layer), 48 mg ephedrine hydrochloride (16 mg in the immediate release layer and 32 mg in the sustained release layer), and 25 mg phenobarbital in the immediate release layer

SUSTAINED ACTION

Each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine HCl, and 2 mg phenobarbital; the alcohol content is 15%.

See next page for brief summary.

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TEDRAL®

TEDRAL® SA Sustained Action

TEDRAL® Elixir

CAUTION: Federal law prohibits dispensing Tedral SA without prescription.

Description. Tedral: each tablet contains 130 mg theophylline, 24 mg ephedrine hydrochloride, and 8 mg phenobarbital.

Tedral SA: each tablet contains 180 mg anhydrous theophylline (90 mg in the immediate release layer and 90 mg in the sustained release layer); 48 mg ephedrine hydrochloride (16 mg in the immediate release layer and 32 mg in the sustained release layer); 25 mg phenobarbital in the immediate release layer.

Tedral Elixir: each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine hydrochloride, and 2 mg phenobarbital; the alcohol content is 15%.

Indications. Tedral, Tedral SA, and Tedral Elixir are indicated for the symptomatic relief of bronchial asthma, asthmatic bronchitis, and other bronchospastic disorders. They may also be used prophylactically to abort or minimize asthmatic attacks and are of value in managing occasional, seasonal or perennial asthma.

Tedral SA (Sustained Action) offers the convenience of b.i.d. dosage.

Tedral Elixir is convenient for persons who may have difficulty in swallowing tablets.

These Tedral formulations are adjuncts in the total management of the asthmatic patient. Acute or severe asthmatic attacks may necessitate supplemental therapy with other drugs by inhalation or other parenteral routes.

Contraindications. Sensitivity to any of the ingredients; porphyria.

Warnings. Drowsiness may occur. PHENOBARBITAL MAY BE HABIT-FORMING.

Precautions. Use with caution in the presence of cardiovascular disease, severe hypertension, hyperthyroidism, prostatic hypertrophy, or glaucoma.

Adverse Reactions. Mild epigastric distress, palpitation, tremulousness, insomnia, difficulty of micturition, and CNS stimulation have been reported.

Average Dosage. *Prophylactic or Therapeutic.*

Tedral: *Adults*—One or two tablets every 4 hours. *Children*—(Over 60 lb) one-half the adult dose.

Tedral SA: *Adults*—One tablet on arising and one tablet 12 hours later. Tablets should not be chewed. *Children*—Not established for children under 12.

Tedral Elixir: Note: One teaspoonful is equivalent to *one-quarter* Tedral tablet. *Children*—One teaspoonful per 30 lb body weight, every 4-6 hours, unless prescribed otherwise by physician. Should be given to children under 2 years of age only with extreme caution. *Adults*—One to two tablespoonfuls every four hours.

Supplied. Tedral: White, uncoated scored tablets in bottles of 24 (N 0047-0230-24), 100 (N 0047-0230-51) and 1000 (N 0047-0230-60). Also in Unit Dose—package of 10 x 10 strips (N 0047-0230-11).

Tedral SA: Double-layered, uncoated, coral/mottled white tablets in bottles of 100 (N 0047-0231-51) and 1000 (N 0047-0231-60). Also in Unit Dose—package of 10 x 10 strips (N 0047-0231-11).

Tedral Elixir: Dark red and cherry-flavored in 474 ml (16 fl oz) bottles (N 0047-0242-16).

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Minnesota State Medical Association Life Insurance

Why Buy Life Insurance?

THAT'S A LEGITIMATE question in these inflationary times, and it deserves a no-nonsense answer.

Americans buy more life insurance than any other people in the world. During 1975, while the nation's economy was struggling to reverse its steepest decline since the 1930s, Americans purchased $292.5 billion of new life insurance, and our total life insurance protection increased to $2140 billion in force, an average of $33,100 for each insured family in the country. Our 150 million people in the U.S. own life insurance. In Minnesota alone, some six million people are insured for over $40 billion of life insurance.

Most people buy life insurance primarily to protect their families, in case of a family member's premature death. Reduced to its simplest terms, life insurance provides dollars at an uncertain time in the future when the dollars will be needed most.

But, say, you're young, single, in good health, perhaps still in school or just starting a practice. You don't have dependent children or other relatives to worry about. What can life insurance do for you?

If you were to die tomorrow, in our modern, interdependent society, considerable expense—hospital bills and funeral costs, for example—could suddenly be incurred. And if you have outstanding debts, who would pay them? If you simply want to "die even with the world" and not burden anyone with your funeral expenses and debts, you should buy some life insurance. This is the historical foundation for the beginnings of the life insurance business. People needed a mechanism through which they could pay regular amounts in advance, based upon their life expectancy, to guarantee the payment of a sum of money at their death at an uncertain time in the future to a "beneficiary" who would then take care of the death expenses. Such "burial policies" continue to be marketed today, but in very limited amounts.

People today buy life insurance for totally different reasons than simply to pay final expenses. They want to replace some or all of the income their families or business associates would lose if they died. This is the "human life value" approach to life insurance.

For members of the medical profession, this income-replacement need for life insurance is particularly great. For most physicians, the overwhelming financial loss, in case of premature death, is the loss of their potential earnings.

As a physician, your most valuable asset is your human life value or your earning power throughout your working years. Life insurance enables you to indemnify some portion of your future earnings, guaranteeing a lump sum payment, and/or a continuation of income to your family or others to whom you have financial obligations.

For example, if a physician, age 30, should die leaving a widow, age 30, and a child, age three, the financial loss to his widow and child would be the earnings the physician would have made up to his retirement—less that portion that would have been spent for his personal needs. This loss would be so great for a young family that the physician would not be able to provide for his widow and children—certainly not through accumulated savings. However, through life insurance, a physician can guarantee a stable monthly income: (1) for the family during a readjustment period and while the children are growing up, and (2) for the widow after the children are on their own.

For physicians who work together with other professionals in a partnership or professional corporation, life insurance is needed on each of the partners or principal officers in an amount based on the financial contribution of each to the partnership or corporation. This assures the smooth continuation of the practice of the partnership or professional corporation.

Of course, the physician who accumulates a sizable estate must be concerned with having sufficient cash or other liquid assets with which to pay estate taxes. Life insurance can be used to generate the cash at exactly the time it is needed.

This leads us to the complicated and often-asked question:

How Much Life Insurance is Enough?

Exactly how much life insurance you need obviously depends on your current income and income-growth potential, your family responsibilities, your financial obligations, and your long-range personal objectives, including your plans for retirement.

A group of economists, bankers, and insurance specialists recently devised a rather simple "multiples-of-salary chart" for calculating the life insurance needs of a family of four whose breadwinner had died.* The experts determined that the family could maintain its standard of living with 75% of the breadwinner's after-tax income. But, if the family winds up with an income of less than 60% of the pre-death level, its living standard will be seriously lowered. The experts advised that a breadwinner plan to provide the family with at least 60%, and 75%, if possible, of current net income. The "multiples-of-salary chart" enables you to easily determine how much life insurance is needed to meet those targets.

The chart is constructed to take a number of factors into account. For example, insurance alone would not finance replacement income goals; the chart assumes that the family will receive Social Security benefits, too. Also, the chart assumes that insurance proceeds would be invested to produce, after inflation, a return of about 5% a year, and that the principle would be gradually converted to the family's use, so that by the time of the surviving spouse's death—based on average life expectancies—it would disappear. The chart ignores income from personal assets such as savings, pension funds, or inheritances. Obviously, the chart is based on the earning power or "human life value" concept of insurance needs. The experts advise that liquid assets or additional life insurance up to one year's gross income be kept for funeral and other death expenses and emergencies.

Here's How the Chart Works

If your annual gross income is $40,000 a year, your spouse is 45 years old and you aim to replace 75% of net income, you will need an insurance payoff of 8.0 times your gross income or $320,000. But the needed amount of insurance varies widely. If your spouse is 25 years old, you earn $23,500 a year before taxes and your goal is to replace 60% of your after-tax income, you need only 4.5 times your gross earnings, or $105,750 in life insurance. The explanation for this difference is that the family of a younger physician fully insured by Social Security would get higher benefits. The Social Security benefits of the older family are weighed down by lower covered earnings over a longer past period.

To use the accompanying chart, simply multiply the factor under your income replacement goal by your present *gross* earnings. The result is the approximate amount of life insurance you need. If your gross earnings or your spouse's age falls between the figures shown, you can calculate your multiple by averaging.

The Multiples-of-Salary Chart
Present Age of Spouse

Your Present	25 Years		35 Years		45 Years		55 Years	
Gross Earnings	75%	60%	75%	60%	75%	60%	75%	60%
$7,500	4.0	3.0	5.5	4.0	7.5	5.5	6.5	4.5
9,000	4.0	3.0	5.5	4.0	7.5	5.5	6.5	4.5
15,000	4.5	3.0	6.5	4.5	8.0	6.0	7.0	5.5
23,500	6.5	4.5	8.0	5.5	8.5	6.5	7.5	5.5
30,000	7.5	5.0	8.0	6.0	8.5	6.5	7.0	5.5
40,000	7.5	5.0	8.0	6.0	8.0	6.0	7.0	5.5
65,000	7.5	5.5	7.5	6.0	7.5	6.0	6.5	5.0

Minnesota State Medical Association Plan

Minnesota physicians should be aware of the fact that they have access to a very economical group term life insurance program sponsored by the Minnesota State Medical Association.

Under the MSMA plan, all active MSMA members under age 60—regular, residency, intern, and student—are eligible for six different levels of coverage: $27,500; $41,250; $68,750; $110,000, $200,000, and $250,000.

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*Wall Street Journal, December 6, 1976.

The following table shows the annual premium rate for each $1,000 of coverage under the MSMA plan:

Age	MSMA Group Term Life Insurance Annual Premium per $1000 Coverage
Under 30	$ 1.05
30-34	1.37
35-39	2.45
40-44	3.27
45-49	6.00
50-54	9.82
55-59	14.73
60-65	25.00

The reason "even" amounts are not available under the MSMA program is not because someone is trying to make it complicated. It's because benefit levels under the program have been increased periodically at no increase in premium, reflecting the fact that actual mortality experience under this program has been better than was assumed in the original rate calculations. These "premium credits" or dividends have averaged 31.6% since the program's inception in 1959. Of course, such credits cannot be guaranteed since they depend on the actual claim experience of the program.

Although a $50,000 coverage option is not available under the MSMA plan (closest are the $41,250 plan and the $68,750 plan), we can compare the cost of MSMA group term life insurance with the cost of an individual five-year renewable term life insurance policy. Let's take a physician, age 40. The cost of a $200,000 individual renewable term policy would be about $1,094.00. At age 40, the MSMA plan costs $3.27 per year for each $1,000 coverage. Thus, the cost of $200,000 coverage under the plan comes to $654.00. It should be noted, however, that the net cost for an insured member at the 1977 renewal was actually substantially less in view of the fact that a 40% premium credit dividend was declared. Taking that factor into account, the actual net premium cost was $392.40.

This obvious difference in annual cost between the individual policy and the group protection is a direct result of the high class of risk and the economies afforded by a group-marketed program. Similar calculations at other ages will yield similar cost savings.

Another vital feature of the MSMA program is that new members—who are new to the profession, and military service returnees—are guaranteed up to $68,750 coverage, regardless of their medical history. If the new member enrolls in the $41,250 plan, he may increase to the $68,750 plan on the third anniversary of his enrollment, without evidence of insurability. Or, if originally enrolled in the $27,500 plan, the member may increase to the $41,250 plan on the third anniversary of his enrollment, also without evidence of insurability.

The MSMA program is underwritten by Northwestern National Life Insurance Company, a well-regarded insurer based in Minneapolis. NWNL presently has over $10 billion group life insurance in force and ranks in the top 3% in size of all U.S. life insurance companies.

In order to keep pace with the increasing coverage needs of Minnesota physicians, the MSMA program has expanded its maximum coverage limit several times, having gone from a maximum of $30,000 coverage in 1959 to the present $250,000 maximum in 1975. Insured MSMA members can increase their coverage under the program up to the $250,000 maximum by providing satisfactory evidence of insurability.

Many physicians will have protection needs in excess of the MSMA program maximum. Consequently, the services of a professional life insurance agent may be needed to be sure the physician's personal life insurance program is sufficient and contains an appropriate mix of term and permanent life insurance.

Insurance decisions are not easily made. What is best for one person may not be right for another. And the coverage needs of any one person can be expected to change as time passes. Minnesota medical students and physicians certainly should consider including the MSMA program in their life insurance program . . . on balance, its 17-year record proves it to be probably the finest insurance value available to members of any medical association.

Carl E. Christenson, M.D.
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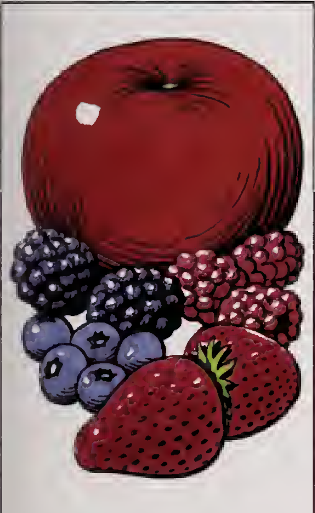

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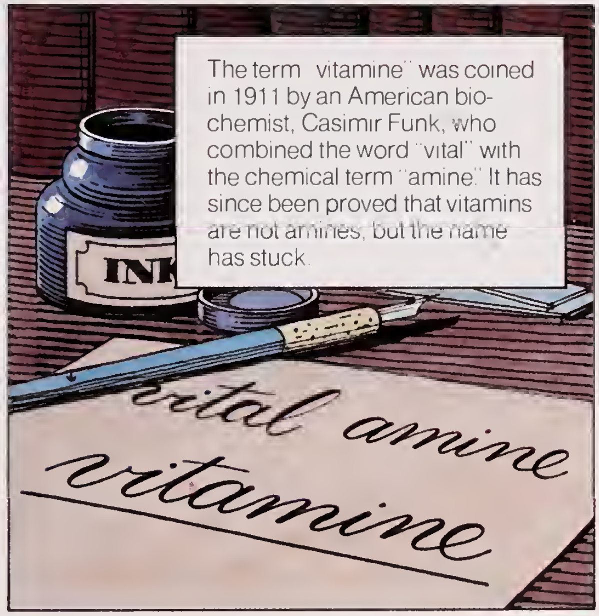

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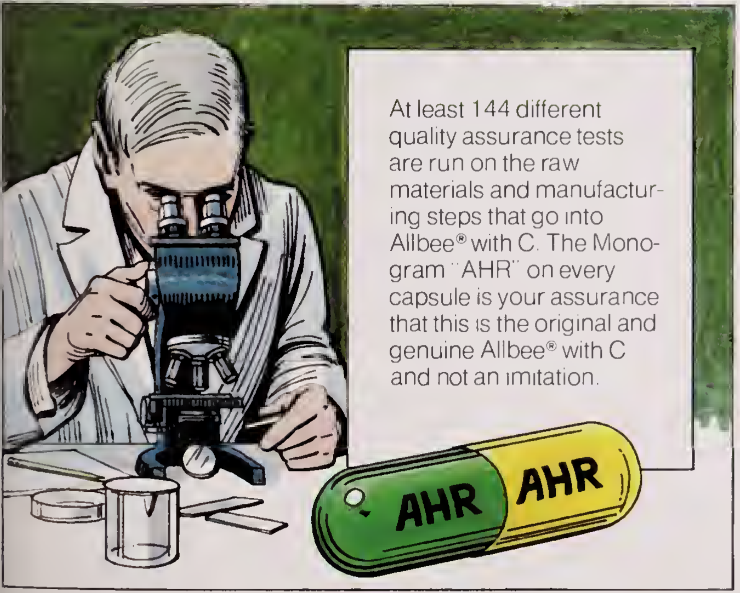

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Letters to the Editor

Sudden Infant Death Syndrome

Dear Editor:

I read with great interest the laboratory letter of Dr. Ralph Franciosi in your January issue of Minnesota Medicine*. I am in complete agreement with Dr. Franciosi regarding the role of the pathologist in establishing S.I.D.S. However, I would suggest that he does not go far enough. A mechanism which he does not mention is that of fatal arrhythmias. The possibility of involvement of lesions of the conducting system in S.I.D.S. was first raised by Dr. James[1] in 1969. While my own views[2,3] and those of others[4,5] do not coincide precisely with those of Dr. James,[1,6] we are all agreed that the problem of involvement of the conducting tissues will only be elucidated when more investigating pathologists show interest in this system. The work involved in performing serial sections of an infantile heart is heavy, but not exclusive. Much of the mystique surrounding the conducting tissue relates to the hesitancy of pathologists to investigate it. While not suggesting that lesions of the conducting system can explain all S.I.D.S. cases, they cannot be ruled out as a cause of some of these tragedies, and indeed, may be averted if electrocardiographic anomalies are noted during the neonatal period.[3] May I therefore endorse Dr. Franciosi's plea that the pathologist thoroughly investigate such cases, but extend the plea to include study of the cardiac conduction system.

Robert H. Anderson, B.Sc., M.D., M.R.C.Path.
Senior Lecturer in Paediatrics
University of London
London, England

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*Diagnosis of Sudden Infant Death Syndrome. 60:1:43 ,1977.

References

1. James TN: Sudden death in babies: new observations in the heart. Amer J Cardiol 22:479, 1968.
2. Anderson RH, Bouton J, Burrow CT and Smith A: Sudden death in infancy: a study of the cardiac specialized tissue. Brit Med J 2:135, 1974.
3. Southall DP, Vulliamy DG, Davies MJ, Anderson RH, Shinebourne EA and Johnson AM: A new look at the neonatal electrocardiogram. Brit Med J 2:599, 1976.
4. Valdes-Dapena M, Greene M, Basavarand W, Catherman R and Truex RC: The myocardial conduction system in sudden death in infancy. N Engl J Med 289:1179, 1973.
5. Lie JT, Rosenberg HS and Erickson EE: Histopathology of the conduction system in the Sudden Infant Death Syndrome. Circulation 53:3, 1976.
6. James TN: Sudden death of babies. Circulation 53:1, 1976.

Sudden Infant Death

Dear Editor:

I would like to thank Dr. Robert H. Anderson for his letter regarding the article "Diagnosis of Sudden Infant Death Syndrome." Dr. Anderson points out that there is concern that fatal cardiac arrhythmias might be the cause of certain cases of Sudden Infant Death Syndrome. This remains a theoretical possibility, and studies should document whether this is indeed a reality. James[1] reported changes in the cardiac conduction system which could be seen histologically in infants who died of crib death or explained causes of death. He speculated that since the conduction system was developing it might be prone to trigger arrhythmias and hence result in infant death. Dr. Valdes-Dapena[2] undertook a study of the cardiac conduction system to either substantiate or disprove the hypothesis proposed by Dr. James. She was not able to demonstrate the same changes. Similar studies of the cardiac conduction system histologically in crib death by Anderson[3] and Lie[4] failed to substantiate the changes noted by Dr. James. At this stage, then, there is no evidence for histologic change in the conduction system of infants that die of SIDS.

My article on SIDS did not go over all theories regarding causation. It simply represented an attempt to call attention to those responsible for identification of SIDS cases, namely the pathologists, that rapidity of diagnosis is important for counseling purposes. I fully agree with Dr. Anderson that there are a variety of histologic studies that should be done which either by their positive or negative

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results will aid in understanding SIDS. I would feel that, for example, if one were studying the cardiac conduction system, because the procedure requires special preparation, that these cases be referred to an interested investigator who would then have sufficient data to perform a meaningful study.

Ralph A. Franciosi, M.D.
Director of Laboratories
Children's Health Center, Inc.
Minneapolis, Minnesota

References

1. James TN: Sudden death in babies: New observations in the heart. Amer J Cardiol 22:479, 1968.
2. Valdes-Dapena M et al:. The myocardial conduction system and sudden death in infancy. Amer J Path 70:272, 1973.
3. Anderson RH et al.: Sudden death in infancy: A study of cardiac specialized tissue. Brit Med J 2:135, 1974.
4. Lie JT, Rosenberg HS, Erickson EE: Histopathology of the conduction system in the sudden infant death syndrome. Circulation 53:3, 1976.

Placebo Effect on Exercise Response

Dear Editor:

We thank Dr. G. T. Gau for his interest in our manuscript,* and we would like to reply to his comments.

The coefficient of variation (c.v.) expressed in the Figure and Table represent the average variability for each patient, and it is not the variation between individuals. We were interested in learning the month-to-month variability of the HR, HR x BP, and Ex time at symptom tolerated maximum exercise (STME) in each patient. For example, for each patient the HR at STME was determined on three occasions and the mean, S.D., and coefficient of variation calculated for each patient (as described in page 843).† The coefficient of variation listed in the Figure and Table (page 841), then represents an average of those values. Thus it expresses the average variability one might expect in a given patient. Since, in the interest of economy of space, we did not list the individual values the c.v. could not be calculated from the data given.

Our patients are similar and were carefully selected, but they are representative of patients with stable angina pectoris, a positive electrocardiographic response during exercise, and significant coronary artery disease. For example, a range of HR from 103 to 161 (our range) at STME would be expected in such a group of patients. It is exactly such patients who are subjected to surgery or given medical therapy for the relief of angina, and objective indicators of the response to such therapy are needed. It is important to determine the reproducibility of those objective measurements at STME in such patients while receiving placebo therapy.

Criticism is offered of the use of grade 2 pain as a subjective endpoint implying that a more objective endpoint would be preferable. The very essence of our study is that grade 2 pain occurs at a reproducible HR, HR x BP and to a lesser extent, exercise time. This endpoint has been used successfully in other laboratories as well. In addition, recent data indicates that other "harder" endpoints, such as ST segment depression, may be no less variable than the endpoints chosen.[1]

Thus, we feel that our study amply supports the contention that the easily measured variables of HR, HR x BP, and exercise time are reproducible at STME in patients with severe ischemic heart disease and are unaffected by placebo therapy.

Fred L. Gobel, M.D.
Minneapolis, Minnesota

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*Gau GT: Placebo Effect on Exercise Response and Nitroglycerin Consumption. 60:3:177, 1977
†Hartman, Keith E. et al.: Minnesota Med 59:839, 1976.

Reference

1. Graboys TB, Podrid PJ and Lown B: The reproducibility of profound ST segment depression to maximal exercise treadmill testing. Am J Cardiol 39:288, 1977.

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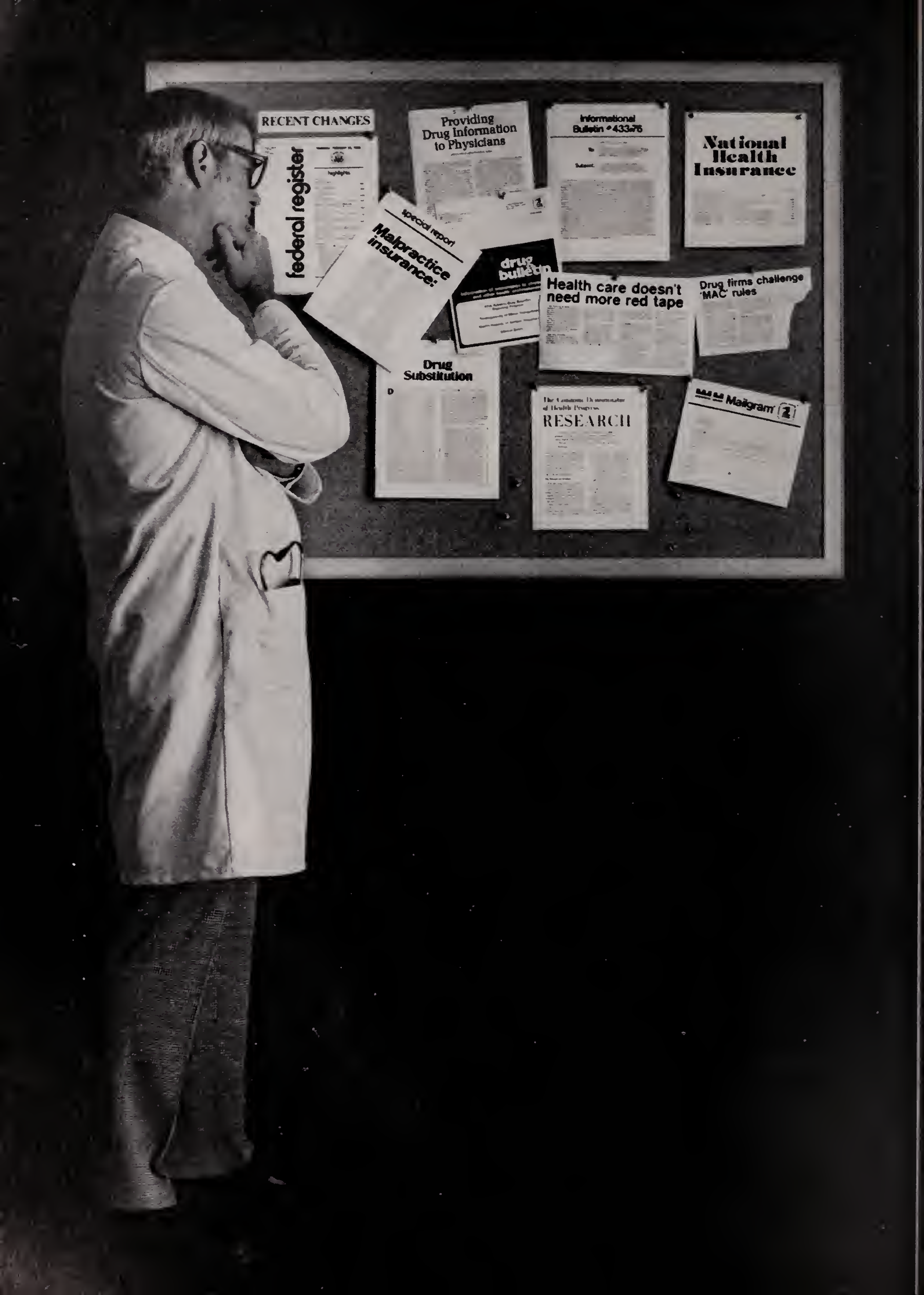
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The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than $1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

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Minnesota Radiologists

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The College, a professional medical society representing about 12,000 physicians who specialize in radiology, awarded certificates of Fellowship to these physicians during its annual meeting in Houston.

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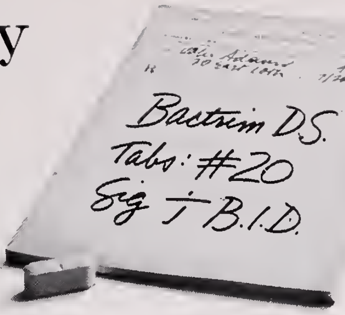

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recautions: Use cautiously in patients with impaired renal or hepatic unction, possible folate deficiency, severe allergy or bronchial sthma. In patients with glucose-6-phosphate dehydrogenase defi-iency, hemolysis, frequently dose-related, may occur. During ther-py, maintain adequate fluid intake and perform frequent urinalyses, ith careful microscopic examination, and renal function tests, par-icularly where there is impaired renal function.

dverse Reactions: All major reactions to sulfonamides and trimeth-prim are included, even if not reported with Bactrim. *Blood dys-rasias:* Agranulocytosis, aplastic anemia, megaloblastic anemia, hrombopenia, leukopenia, hemolytic anemia, purpura, hypopro-hrombinemia and methemoglobinemia. *Allergic reactions:* Erythema multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. *Gastrointestinal reactions:* Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, diarrhea and pancreatitis. *CNS reactions:* Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. *Miscellaneous reactions:* Drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for children under 12. Usual adult dosage: 1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days.

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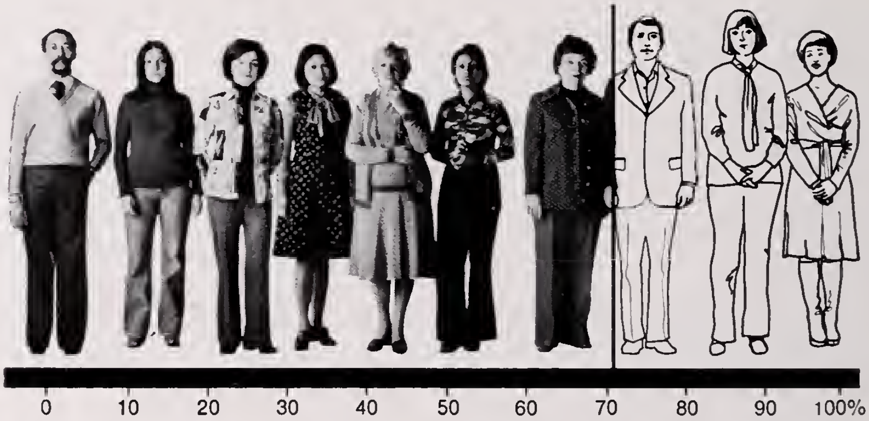

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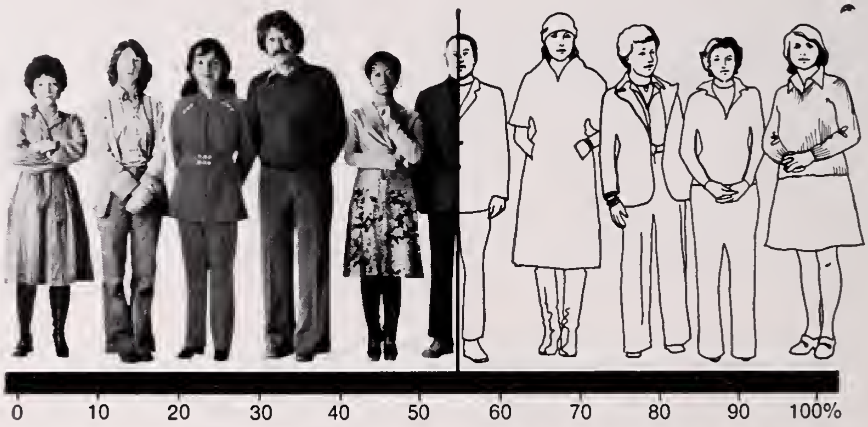

ampicillin–55.4% of 74 patients infection-free at 8 weeks.

*This percentage is arrived at by the statistical method of dividing the difference between Bactrim and ampicillin results (15.1%) by the percent of ampicillin results (55.4%).

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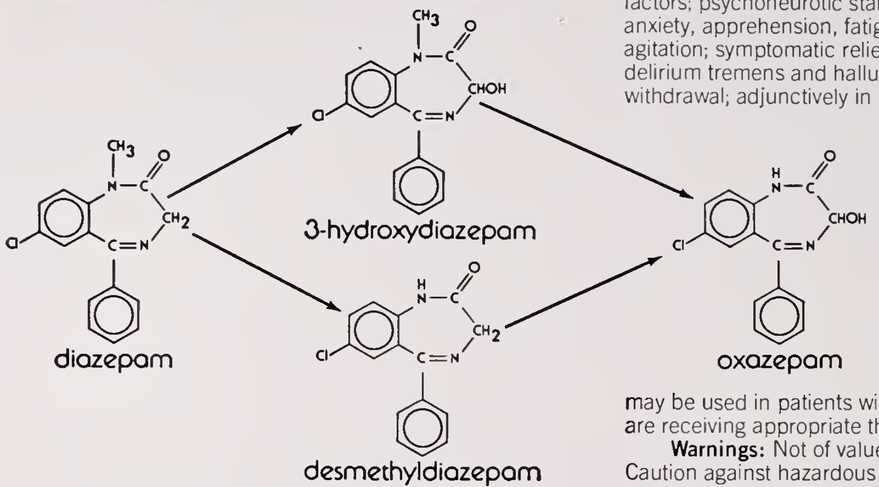
A pharmacokinetic character all its own



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Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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President's Letter

All of Us Together

Presidents come and go, and I would be amiss if I did not thank my predecessor, Dr. Anonsen, for the multiple suggestions he has given me along the way.

I do cherish this opportunity I have for the next twelve months to communicate with you via the President's Letter in MINNESOTA MEDICINE. I would hope that what I say will be timely, practical, and informative for much is happening these days that affects our practices and what is even more important affects our personal relationship with our patients.

When I first started practice some thirty years ago, I had the fortune of being tutored both in diagnosis and surgery by a physician of the old school. Otto had posted on his waiting room wall this slogan, in large old English scroll: "There is no use explaining. Your friends don't need it, and your enemies don't believe it anyhow." He truly lived and practiced by this slogan.

Today, in the age of consumerism, a number of us might like to live by that slogan, but none of us can afford to do so. In the age of informed consent, multiple professional liability suits, and an ever burgeoning bureaucracy of the government's wanting to control our practices, we continue to explain, to our patients, their relatives, hospital administrators, government agencies, and the list goes on and on. We continually explain what we want to do, what the risks are, and what the possible results may be; but as long as we are explaining, let us, each one, take just two to three minutes every day with three or four of our most influential patients and tell them how National Health Insurance will influence our practice and our relationship with them, why medical costs are what they are, and what part in that escalating cost government regulations and government induced inflation play. Finally how the ever increasing professional liability suits being filed by unhappy or dissatisfied patients are affecting the way we practice and the charges we must make.

In my estimation these are the three most important problems that medicine faces today and will face in the next five years: (1) Escalating costs of medical care, (2) Professional liability insurance costs, and (3) National Health Insurance, all of them in that order. None of these are going to be solved without taking our patients into our confidence and seeking their help. We must ever play the role of the patient's advocate not his adversary.

We all cherish Freedom. Freedom to practice medicine to the best of our ability, but we must protect the freedom of our patients to choose their own methods of care and their own physician. Freedom does not come now and never has come cheaply. Apathetic physicians will soon become government-employed physicians with all the rules and regulations that implies.

Last December, in Philadelphia at the AMA meeting, I had the privilege of meeting with the President-elects and the Presidents of the 50 state medical associations. One of our speakers was an executive in the Department of HEW. These are the words he spoke: "Government can never take over the practice of medicine, unless the private practicing physicians of this country assist them in doing so."

My plea to you, as incoming President, is to urge all of you to give *all* the assistance you can to organized medicine, both in dollars, knowledge, and time so that we *all* can remain free to practice good medicine. Don't let George do it. He just can't handle it without the help of each and every one of you.

C. A. Anderson MD

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Editor's Notebook

Read With Care

Read this with great care.

For this editorial shows one of the tricks of those who try to write well. To write well is no small trick. It takes skill, thought, and choice. There are no shortcuts—no roads to glory. You have to spend time at it, and you must choose the right words. Still a trick or two helps.

As you read these words, see if you can spot the trick, which goes on right now in front of your nose.

The trick works, and it works well. It works best for those with clear minds, but not so well for those who are not sure what they want to say. It works, too, for you who read what we who use tricks write.

Look back at what you have read. Have you known each word so far? And have you had a good grasp of the flow of thoughts? I hope so. Oh, I know I have not yet told you what the "trick" is, but that will come. While I still have you on the hook, I just want to make sure you know what each word means and that you have the gist of all that passes in front of your eyes.

Now, if you are still with me, I shall go on.

This trick also serves those who write tales, as well as those who deal in facts. There are those who say the trick won't work in the field of Medicine. I don't think they are right. If I can do it, as I am now, you can too. But we both can learn from fiction, as this tale shows:

> "Life lays down strange paths which the feet of man must tread in the dark.
>
> When Baer told me this tale I felt full of awe and tears. Baer does not lie. He is a good man, and his clear eyes are full of plain, strong truth.
>
> I know Baer. He has the heart of a saint—fresh and pure as a deep well, in spite of all the hard, sad years of his life.
>
> We met on the stairs of Time: I was on my way up; he was on his way down. I was young, he was old, and poor—so poor that he did not know when luck would send him a meal and a bed.
>
> His coat was thin; wind and rain bit right through it. Yet he could bear his head high and face life with a fine calm.
>
> It is sad when a man is too weak to work, too strong to die, and too proud to beg . . . sad, yet great. Baer was a great man. This is what he told me:
>
> It has been the will of Fate—or what you like—that all I made they had to break. All that I ever got, I lost. Well, let it be like that.

> All is gone—all but what was mine as the gift, the gift to me, of God.
>
> What I have not lost is best of all. That I cannot lose. I mean my soul. If a man keeps his soul, all can he got back in the end; so that in the end that man has won, not lost.
>
> (That was how Baer spoke—in short, clear words.)"[1]

Well, the last sentence gives the jig up. What trick have I been playing? Simply this: I have been showing you can write understandable, graceful, and clear prose by sticking to words of one syllable. To throw you off the scent, seven words (editorial, glory, shortcut, writer, medicine, fiction, and cannot) of more than one syllable were used. But 548 of 555 words, or 99 percent, had one syllable.

I am not asking you to write your papers for *Minnesota Medicine* exclusively in monsyllables. That would be too hard to sustain, and in the end, would be choppy, boring, and childish.

But I do want to expose you to the beauty and elegance of small words. Short words, properly used, have grace, power, and clarity. To sum up, then, short words are best.

Richard L Reece MD

Reference

1. Kersh, Gerald, in The Writer's Craft, Frederic A. Birmingham, Editor, Hawthorne Books, New York 1958.

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	Starting Dosage	Increased Monthly by	Usual Maintenance	Maximal Recommended
Adult Hypercholesterolemic	1.0-2.0 mg.	1.0-2.0 mg.	4.0-8.0 mg.	4.0-8.0 mg.
Pediatric Hypercholesterolemic	0.05 mg./kg. body weight	0.05 mg./kg.	0.1 mg./kg. body weight	4.0 mg.
Hypothyroid Cardiac	1.0 mg.	1.0 mg.	4.0 mg.	4.0 mg.

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Description
CHOLOXIN (sodium dextrothyroxine) is the sodium salt of the dextrorotatory isomer of thyroxine. It is chemically described as D-3,5,3′,5′-tetraiodothyronine sodium salt.

Actions
The predominant effect of CHOLOXIN (sodium dextrothyroxine) is the reduction of serum cholesterol levels in hyperlipidemic patients. Beta lipoprotein and triglyceride fractions may also be reduced from previously elevated levels.

Most of the available evidence indicates that CHOLOXIN (sodium dextrothyroxine) stimulates the liver to increase catabolism and excretion of cholesterol and its degradation products via the biliary route into the feces. Cholesterol synthesis is not inhibited and abnormal metabolic end-products do not accumulate in the blood.

Indications
This is not an innocuous drug. Strict attention should be paid to the indications and contraindications.
CHOLOXIN (sodium dextrothyroxine) is an antilipidemic agent used as an adjunct to diet and other measures for the reduction of elevated serum cholesterol (low density lipoproteins) in euthyroid patients with no known evidence of organic heart disease.
The drug is also indicated in the treatment of hypothyroidism in patients with cardiac disease who cannot tolerate other types of thyroid medication.
Before prescribing, note the following: Results from a randomized clinical study have indicated a possible adverse effect when CHOLOXIN (sodium dextrothyroxine) is administered to a patient receiving a digitalis preparation. There may be an additive effect. This additive effect may possibly stimulate the myocardium excessively, in patients with significant myocardial impairment. CHOLOXIN (sodium dextrothyroxine) dosage should not exceed 4 mg per day when the patient is receiving a digitalis preparation concomitantly. Careful monitoring of the total effect of both drugs is important.
It has not been established whether the drug-induced lowering of serum cholesterol or lipid levels has a detrimental, beneficial, or no effect on the morbidity or mortality due to atherosclerosis or coronary heart disease. Several years will be required before current investigations will yield an answer to this question.

Contraindications
The administration of CHOLOXIN (sodium dextrothyroxine) to euthyroid patients with one or more of the following conditions is contraindicated:

1. Known organic heart disease, including angina pectoris; history of myocardial infarction; cardiac arrhythmia or tachycardia, either active or in patients with demonstrated propensity for arrhythmias; rheumatic heart disease; history of congestive heart failure; and decompensated or borderline compensated cardiac status.
2. Hypertensive states (other than mild, labile systolic hypertension).
3. Advanced liver or kidney disease.
4. Pregnancy.
5. Nursing mothers.
6. History of iodism.

Warnings
CHOLOXIN (sodium dextrothyroxine) may potentiate the effects of anticoagulants on prothrombin time. Reductions of anticoagulant dosage by as much as 30% have been required in some patients. Consequently, the dosage of anticoagulants should be reduced by one-third upon initiation of CHOLOXIN therapy and the dosage subsequently readjusted on the basis of prothrombin time. The prothrombin time of patients receiving anticoagulant therapy concomitantly with CHOLOXIN therapy should be observed as frequently as necessary, but at least weekly, during the first few weeks of treatment.

In the surgical patient, it is wise to consider withdrawal of the drug two weeks prior to surgery if the use of anticoagulants during surgery is contemplated.

When CHOLOXIN (sodium dextrothyroxine) is used as thyroid replacement therapy in hypothyroid patients with concomitant coronary artery disease (especially those with a history of angina pectoris or myocardial infarction) or other cardiac disease, treatment should be initiated with care. Special consideration of the dosage schedule of CHOLOXIN (sodium dextrothyroxine) is required. This drug may increase the oxygen requirements of the myocardium, especially at high dosage levels. Treated subjects with coronary artery disease must be seen at frequent intervals. If aggravation of angina or increased myocardial ischemia, cardiac failure, or clinically significant arrhythmia develops during the treatment of hypothyroid patients, the dosage should be reduced or the drug discontinued.

Special consideration must be given to the dosage of other thyroid medications used concomitantly with CHOLOXIN (sodium dextrothyroxine). As with all thyroactive drugs, hypothyroid patients are more sensitive to a given dose of CHOLOXIN (sodium dextrothyroxine) than euthyroid patients.

Epinephrine injection in patients with coronary artery disease may precipitate an episode of coronary insufficiency. This condition may be enhanced in patients receiving thyroid analogues. These phenomena should be kept in mind when catecholamine injections are required in sodium dextrothyroxine-treated patients with coronary artery disease.

Since the possibility of precipitating cardiac arrhythmias during surgery may be greater in patients treated with thyroid hormones, it may be wise to discontinue CHOLOXIN (sodium dextrothyroxine) in euthyroid patients at least two weeks prior to an elective operation. During emergency surgery in euthyroid patients, and in surgery in hypothyroid patients in whom it may not be advisable or possible to withdraw therapy, the patients should be carefully observed.

There are reports that sodium dextrothyroxine in diabetic patients is capable of increasing blood sugar levels with a resultant increase in requirements of insulin or oral hypoglycemic agents. Special attention should be paid to parameters necessary for good control of the diabetic state in dextrothyroxine-treated subjects and to dosage requirements of insulin or other antidiabetic drugs. If sodium dextrothyroxine is later withdrawn from patients who had required an increase of insulin (or oral hypoglycemic agents) dosage during its administration, the dosage of antidiabetic drugs should be reduced and adjusted to maintain good control of the diabetic state.

When either or both impaired liver or kidney function are present, the advantages of CHOLOXIN (sodium dextrothyroxine) therapy must be weighed against the possibility of deleterious results.

Usage in Women of Childbearing Age
Women of childbearing age with familial hypercholesterolemia or hyperlipemia should not be deprived of the use of this drug; it can be given to those patients exercising strict birth control procedures. Since pregnancy may occur despite the use of birth control procedures, administration of CHOLOXIN (sodium dextrothyroxine) to women of this age group should be undertaken only after weighing the possible risk to the fetus against the possible benefits to the mother. Teratogenic studies in two animal species have resulted in no abnormalities in the offspring.

Precautions
It is expected that patients on dextrothyroxine therapy will show greatly increased serum protein-bound-iodine levels. These increased serum PBI values are evidence of absorption and transport of the drug, and should NOT be interpreted as evidence of hypermetabolism; similarly, they may not be used for titrating the effective dose of CHOLOXIN (sodium dextrothyroxine). PBI values in the range of 10 to 25 mcg% in treated patients are common.

If signs or symptoms of iodism develop during CHOLOXIN (sodium dextrothyroxine) therapy, the drug should be discontinued.

A few children with familial hypercholesterolemia have been treated with CHOLOXIN for periods of one year or longer with no adverse effects on growth. However, it is recommended that the drug be continued in patients in this age group only if a significant serum cholesterol-lowering effect is observed.

Adverse Reactions
The side effects attributed to dextrothyroxine therapy are, for the most part, due to increased metabolism, and may be minimized by following the recommended dosage schedule. Adverse effects are least commonly seen in euthyroid patients with no signs or symptoms of organic heart disease; the incidence of adverse effects is increased in hypothyroid patients, and is highest in those patients with organic heart disease superimposed on the hypothyroid state.

In the absence of known organic heart disease, some cardiac changes may be precipitated during sodium dextrothyroxine therapy. In addition to angina pectoris, arrhythmia consisting of extrasystoles, ectopic beats, or supraventricular tachycardia, ECG evidence of ischemic myocardial changes and increase in heart size have been observed. Myocardial infarctions, both fatal and non-fatal, have occurred, but these are not unexpected in untreated patients in the age groups studied. It is not known whether any of these infarcts were drug related.

Changes in clinical status that may be related to the metabolic action of the drug include the development of insomnia, nervousness, palpitations, tremors, loss of weight, lid lag, sweating, flushing, hyperthermia, hair loss, diuresis, and menstrual irregularities. Gastrointestinal complaints during therapy have included dyspepsia, nausea and vomiting, constipation, diarrhea, and decrease in appetite.

Other side effects reported to be associated with CHOLOXIN (sodium dextrothyroxine) therapy include the development of headache, changes in libido (increase or decrease), hoarseness, tinnitus, dizziness, peripheral edema, malaise, tiredness, visual disturbances, psychic changes, paresthesia, muscle pain, and various bizarre subjective complaints. Skin rashes, including a few which appeared to be due to iodism, and itching have been attributed to dextrothyroxine by some investigators. Gallstones have been discovered in occasional dextrothyroxine-treated patients and cholestatic jaundice has occurred in one patient, although its relationship to CHOLOXIN therapy was not established.

In several instances, the previously existing conditions of the patient appeared to continue or progress during the administration of CHOLOXIN (sodium dextrothyroxine); a worsening of peripheral vascular disease, sensorium, exophthalmos, and retinopathy have been reported.

CHOLOXIN (sodium dextrothyroxine) potentiates the effects of anticoagulants, such as warfarin or Dicumarol, on prothrombin time, thus indicating a decrease in the dosage requirements of the anticoagulants. On the other hand, dosage requirements of antidiabetic drugs have been reported to be increased during dextrothyroxine therapy (see WARNINGS section).

Dosage and Administration
For **adult** euthyroid hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is 4 to 8 mg per day. The initial daily dose should be 1 to 2 mg to be increased in 1 to 2 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, if that dosage level is indicated to effect the desired lowering of serum cholesterol.

When used as partial or complete substitution therapy for levothyroxine in hypothyroid patients with cardiac disease who cannot tolerate other types of thyroid medication, the initial daily dose should be 1 mg to be increased in 1 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, preferably the lower dosage. The maximum in patients receiving digitalis therapy is 4 mg.

For **pediatric** hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is approximately 0.1 mg (100 mcg) per kilogram. The initial daily dosage should be approximately 0.05 mg (50 mcg) per kilogram to be increased in up to 0.05 mg (50 mcg) per kilogram increments at monthly intervals. The recommended maximal dose is 4 mg daily, if that dosage is indicated to effect the desired lowering of serum cholesterol.

If new signs or symptoms of cardiac disease develop during the treatment period, the drug should be withdrawn.

How Supplied
CHOLOXIN (sodium dextrothyroxine) is supplied in prescription packages of scored 1, 2, 4, and 6 mg tablets.

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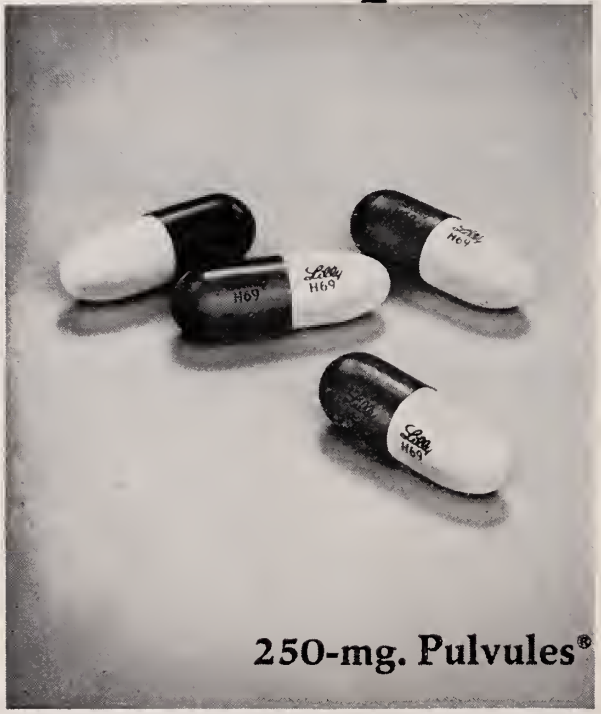
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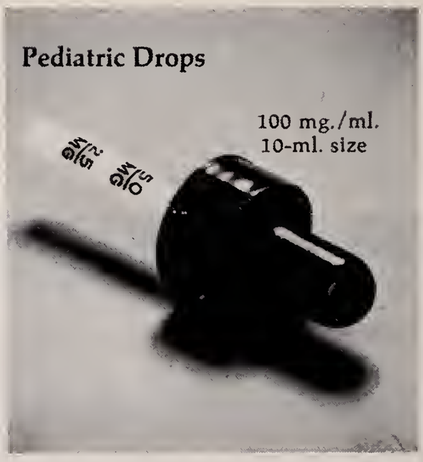
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Arm and Elbow Changes in Expert Tennis Players

JAMES D. PRIEST, M.D.* HENRY H. JONES, M.D.†
CAROL JO CHINN TICHENOR, MA, RPT† and DONALD A. NAGEL, M.D.†

Elbow symptoms occurred at some time in nearly half of the 84 world caliber tennis players in this study. Medial findings developed more frequently in the men than the women. This finding was felt related to the more strenuous serving of the men. Playing extremities exhibited both increases in girth and grip strength, and decreases in range of motion. Hypertrophy of bone in response to stress was found to a striking degree in the racquet holding extremities. The skin and subcutaneous tissue layer was, surprisingly, narrower on the playing side.

BEGINNING IN 1972, we undertook a comprehensive study of highly skilled tennis players. One of the objectives of this investigation was to study "tennis elbow" in the skilled player. With a recent spurt in the popularity of tennis, an increasing number of players are seeking medical advice. A highly skilled group of tennis players was selected because we felt that their more frequent and strenuous periods of exercise would result in greater changes than in average players. Due to the stresses of the game, the elbow is a frequent site of complaint.

A second objective was to study the results of exercise on the upper extremity, especially the bone. Prolonged inactivity of an extremity is known to produce osteoporosis, or reduction of bone, while disagreement exists in the literature on the effects of exercise on human bone. In a recent symposium on metabolic bone disease, Garn stated that ". . . there is no substantive evidence at present that greater activity either increases the skeletal mass or prevents adult bone loss."[1] Other investigators, however, have found evidence that exercise does stimulate bone growth. Nilsson and Westlin measured bone den-

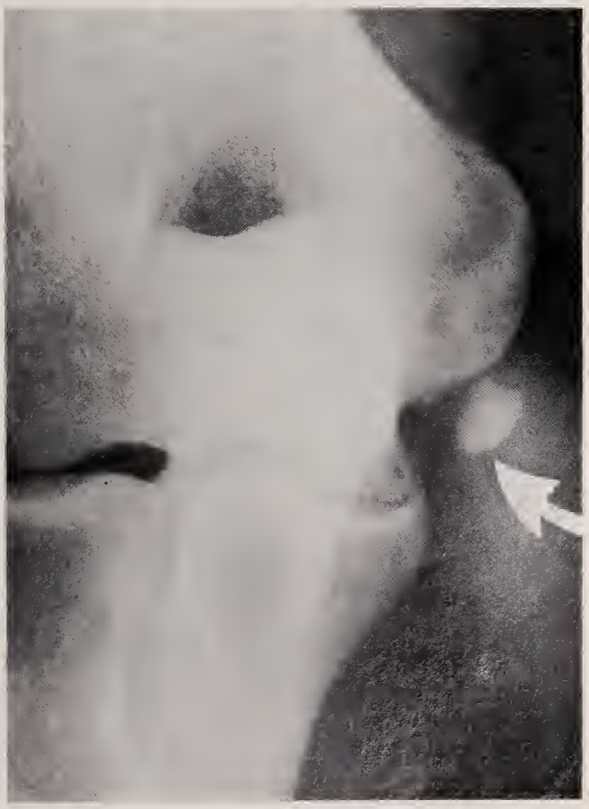

Fig. 1—Bony fragment apparently avulsed off the medial epicondyle of a 26-year-old Davis Cup competitor who fell on an outstretched playing arm.

This study was presented as an exhibit at the American Academy of Orthopaedic Surgeons in Dallas, 1974, and at the American Medical Association Annual Convention in Chicago, 1974, where it won the Hektoen Bronze Medal.

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†Stanford University Medical Center, Stanford, California.

This is the second of two articles on elbow injury in tennis players. In the June, 1976, issue of MINNESOTA MEDICINE the tennis elbow syndrome was described, and a study of average players was presented by Dr. James Priest.

sity in the distal femora of athletes and non-athletes and found significantly denser bone in athletes.[2] They also noted that, among the athletes, increasing load on the lower extremity appeared to be related to increasing density of the bone. Dalen and Olsson found by x-ray spectophotometry that bone mineral content was greater in cross-country runners than a control group.[3] The difference was approximately 20 percent for appendicular skeletal sites, including the upper extremity. Our study of tennis players adds striking documentation that human extremity bones are capable of marked hypertrophy in response to stress.

Materials and Methods

Eighty-four world caliber tennis players were studied, 54 men and 30 women. They represented 19 nationalities, and were among the world's most prominent and skilled tennis players. Three of the men and four of the women were ranked among the top ten players of their sex in 1974. The study included a brief medical history and examination for elbow injury, anteroposterior and lateral roentgenograms of both elbows, and range of motion, grip strength, and girth measurement of both upper extremities.[4-6]

Symptoms

Elbow symptoms had been experienced by 45 percent of the players at some time during their playing careers, and 37 percent of all players had symptoms which were considered major, ranging in duration from several weeks to 15 years of recurrent pain.*

Nearly all of the symptoms occurred in three regions: the lateral epicondyle, the medial epicondyle, and the groove for the ulnar nerve, also known as the cubital tunnel. Eleven of the players, including several of the world's highest ranking players, had experienced lateral epicondylitis or classic "tennis elbow." Twelve of the players had sustained medial epicondylitis, and seven had suffered cubital tunnel pain. In baseball players the most common complaint in the elbow region is medial epicondylitis.[7] This is also true of the male tennis players we studied. Of the men with major symptoms, 40 percent had pain over the medial epicondylar area, and 30 percent had pain in the cubital tunnel region. Thus, 70 percent had pain on the medial side. In contrast with men, symptoms were divided equally between medial and lateral in the women. Other symptoms occurred in the olecranon fossa (two) and distal biceps and extensor muscles (one each).

Joint Findings on Xray

Intra-articular fragments, medial bone deposits, olecranon fractures, and spur formations have been described in the elbows of baseball pitchers and javelin throwers. Similar changes were observed in our tennis players (Figure 1). Bilateral roentgenograms in anteroposterior and lateral projections were obtained from 90 percent of these players. The films of each elbow were examined for changes in 24 specific locations. These included muscle origins and insertions, areas of ligament attachment, and intra-articular regions.

In the men a mean of 6.5 changes per player were found in the exercised elbows, and 0.5 changes in the opposite elbows. In the women 4.7 changes were found on the playing side, and 0.3 on the non-playing side. Thus, the playing side demonstrated 13 times as many findings as the non-playing in both men and women, and the men demonstrated nearly 40 percent more changes in their exercised elbows than did the women. The males had nearly twice as many changes medially as laterally, while the females had changes more equally distributed between medial and lateral. Thus, both symptoms and x-ray alterations were found twice as often medially as laterally in the males, while in the females both were more equally divided between medial and lateral.

Symptoms and Tennis Strokes

When players were asked to identify the strokes which caused them discomfort, forehand and backhand were implicated almost equally in producing lateral epicondylar symptoms, while players with cubital tunnel pain and medial epicondylitis, both on the medial side of the joint, by far implicated the serve as the stroke on which they had pain.

Tullos and King have divided the pitching act into three consecutive phases: the cocking, acceleration, and follow-through phases.[8] The tennis serve is a special variation of the overhand throw, differing in two respects: first, nothing is released as the result of or culmination of the strong forward overhand movement; and second, an object is impacted at the peak of the forward swing. The elbow of a tennis player is thus exposed not only to the medial stress described in throwers, but also to the additional stresses of gripping the racquet so that it will not be released from the hand, and of impacting the ball during the forward phase.

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*The division of symptoms into major and minor was based both on duration (usually longer than two weeks for major) and the player's subjective evaluation of the severity of his own symptoms.

During the serve, especially the spin serve, medial stress is placed on the elbow (Figure 2). After contact with the ball the wrist deviates into flexion and the forearm into pronation. Gripping the racquet during this motion requires thumb and finger flexion. The pronator teres and the wrist and finger flexor muscles take origin in part from the medial epicondyle, and the long thumb flexor muscle often has an accessory origin here.[9] In addition, the medial collateral ligament runs between the medial epicondyle and the coronoid tubercle of the ulna. Prolonged use of this area of the elbow leads to medial symptoms and changes in normal anatomy. Enlargement of the coronoid tubercle was the most frequent x-ray finding in the joints of our male tennis players.

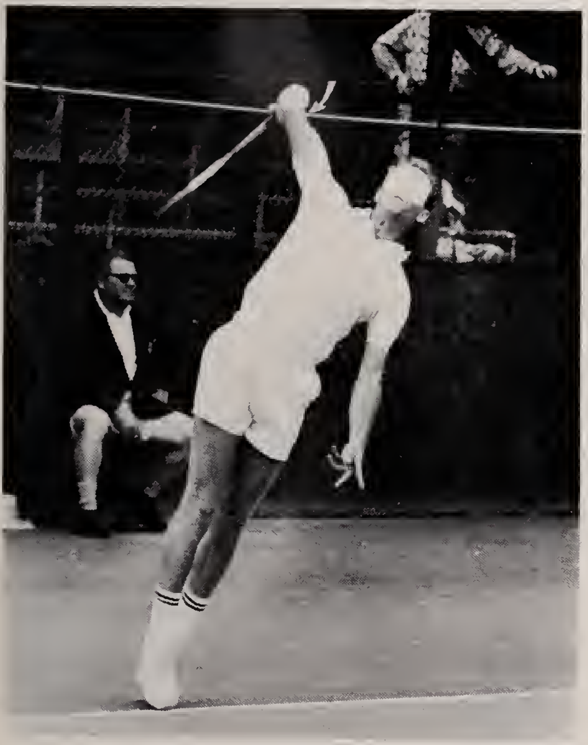

Fig. 2—Veteran professional tennis player at a point during the service motion when medial elbow stress is severe (arrow).

Ulnar Groove Symptoms

Of the men with major symptoms 30 percent had pain within the groove for the ulnar nerve. Pain here was most commonly associated with the serve, and at times specifically the spin serve. The ulnar nerve passes through a tunnel between the two heads of origin of the flexor carpi ulnaris muscle. These two heads wrap around the nerve and partly arise from both sides of the groove. In the tennis serve, spin is partially given to the ball by flexion and ulnar deviation of the wrist, both actions being functions of the flexor carpi ulnaris muscle. If the origin of this muscle was injured by attempting excessive spin, pain would be likely to develop within the ulnar groove, as it did in several of these expert players.

Hypertrophic changes in the epicondylar portion of the tunnel and spurring of the coronoid tubercle were often observed. Coupled with muscular hypertrophy in this region, these changes might be thought to cause impingement of the ulnar nerve, and result in ulnar nerve symptoms. However, only one case was observed with symptoms distinctly referable to the ulnar nerve, in a male aged 23 with marked hypertrophy of the coronoid tubercle.

Trochlear Spurring and the Production of Joint Fragments

An x-ray change in many of the dominant elbows was spurring of the lateral margin of the humeral trochlea. It was found in 36 percent of the playing elbows and only 13 percent of the non-playing ones. Fragments in four playing elbows appeared to result from fracturing of this spur. In our series no evidence was found for either osteochondritis dissecans or aseptic necrosis of the radial head or capitellum. It is our impression that bony fragments in this region in tennis players may be fracture fragments of these trochlear osteophytes, that attenuation of the medial ligament over a period of time may allow the ulna to ride chronically against the lateral portion of the trochlea and result in the formation of a spur, and that this prominence may be broken off either as a stress fracture or during a severe moment of valgus displacement.

Treatment

While none of these athletes were treated by the investigators, the following facts were forthcoming regarding their previous treatment. In an attempt to reduce elbow discomfort, medical treatment was often carried on simultaneously with other forms of management by the athletes themselves. They were known to change racquet handle size, weight, composition, manufacturer, and string tension. Among other measures taken were exercises, alterations of their strokes, and rest. They tried heat, cold, ultrasound, massage, and manipulation. Medications prescribed variously were phenylbutazone, oxyphenbutazone, indomethacin, and cortisone. Since several of these treatments were used simultaneously in individual players, it was not feasible to determine the efficacy of any single factor, but no treatment mode could be singled out for either success or failure. In other words, little can be concluded from this study on the treatment of "tennis elbow."

Range of Motion, Girth Changes, and Grip Strength

As these players participate in what is essentially a one-armed activity, a second area of our investigation was into hypertrophic changes in their playing extremities. Circumferences of both arms and forearms were obtained. Grip strength was tested bilaterally. Range of motion and cubital angle were measured in both elbows.

The playing extremities were found to have larger girths in both men and women (Figure 3). The increase in girth was more than twice as great in the forearm as in the upper arm (Figure 4). The average girth increase was approximately five percent in the arm and 11 percent in the forearm. All of these measurements were statistically significant ($p = 0.001$).

Grip strength was increased in the playing hand by 19 pounds in the men and 21 pounds in the women, representing an average increase in the dominant hand of 20 percent in the men and 33 percent in the women.

Terminal extension of the playing elbow was decreased by 4.1° in the men and only 1.1° in the women. While this was statistically significant in the men, it represented only a minor flexion contracture clinically. However, the combined loss of pronation and supination in the playing extremities averaged nearly 13° in the men and 8° in the women. In contrast with findings in baseball pitchers, there was no significant difference in the cubital angle between playing and non-playing elbows in either sex.[10]

Hypertrophy of Bone

In these athletes, one extremity was persistently stressed, while the opposite acted almost as a control. The skilled tennis player is thus a suitable model for the study of effects of exercise on bone.[11] Measurements were made from the bilateral Xrays on a motion analyzer,* which provided a high degree of both reproducibility and accuracy. Rotation and magnification were carefully accounted for and the degree of hypertrophy of bone found could not have been caused by either. Measurements from the exercised and unexercised arms of the individual players were then submitted for computer analysis of intra-individ-

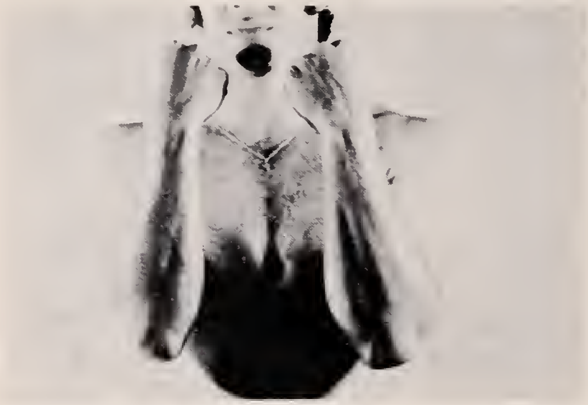

Fig. 3—Left-handed, international male player demonstrating left upper extremity hypertrophy.

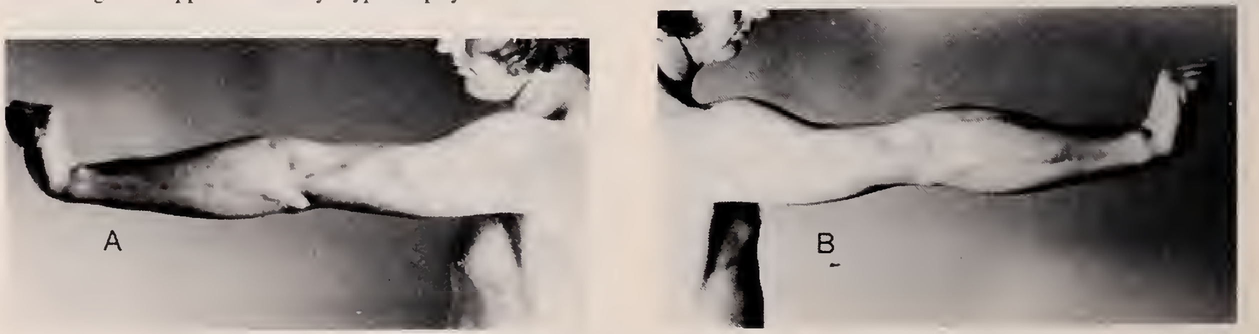

Fig. 4—Former national tennis champion, non-playing side (A), playing side (B). Hypertrophy of the playing extremity is greater in the forearm than the upper arm.

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*Vanguard Instrument Corporation, Melville, New York 11746.

ual differences. Men and women were considered separately.

The difference in bone between playing and non-playing arms was striking (Figure 5). Twelve separate measurements were made on the anteroposterior and lateral Xrays of each humerus (Figure 6). These included full humeral diameter, width of the medullary cavity, intercondylar diameter, and cortical thickness. Each of these measurements, with the exception of one medullary canal width in the females, showed highly significant differences between the two arms ($p = 0.001$). The mean increase in each of the four cortices when measured 11 centimeters proximal to the distal end of the humerus was 35 percent in males and 29 percent in females. At a level eight centimeters proximal to the distal end of the humerus, an average cortical increase of 44 percent was found in the anterior humeral cortex of the male players. While mean cortical thicknesses of the humeri in non-playing arms were nearly identical to those in normal arms for this age group, the means from our playing arms were approximately 2.5 standard deviations above normal for males and 4.0 standard deviations above normal for females.[12,13]

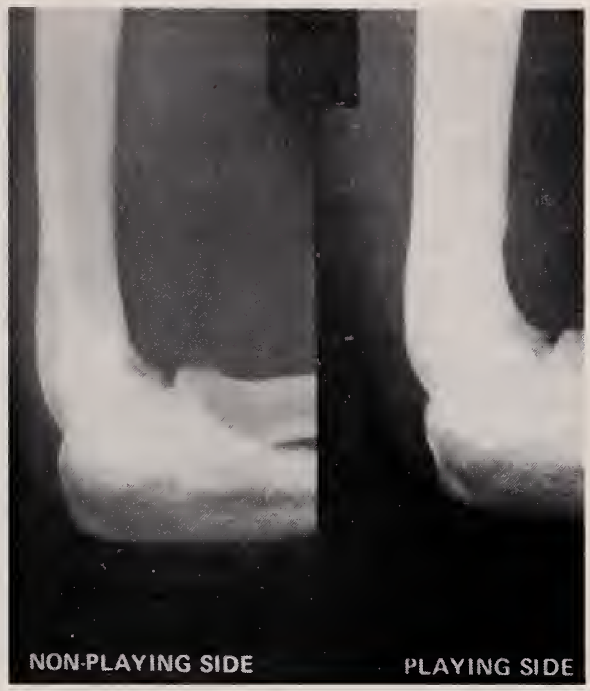


Fig. 5—Non-playing and playing humeri of player in Figure 4 showing marked hypertrophy on the playing side.

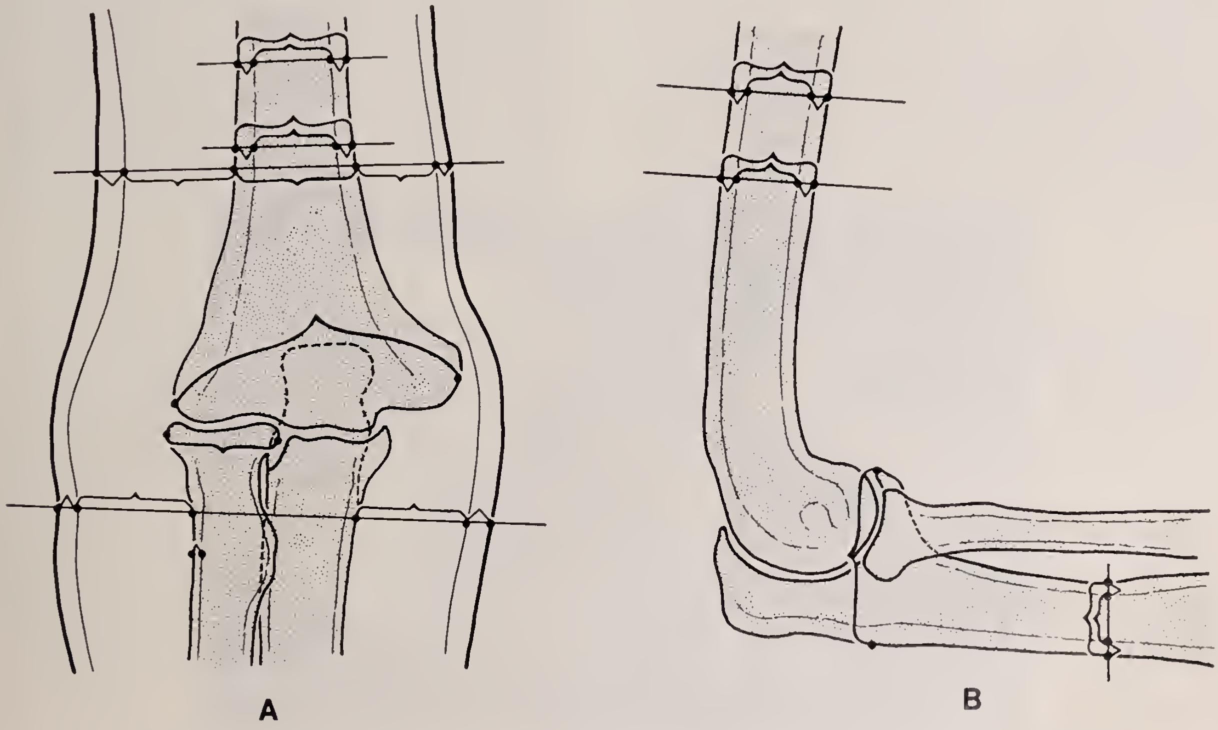


Fig. 6—Measurements of bone, muscle, and skin and subcutaneous tissue layers were made as indicated from the anteroposterior (A) and lateral (B) x-ray projections. Drawings, courtesy of Orthopedics Digest. (Permission granted.)

Similar measurements were made of the proximal radius and ulna. Statistically significant increases on the playing side were found for most of these measurements as well, but with a difference between the two sides of no more than 11 percent. Distal portions of the radial and ulnar shafts were not measured, as the only Xrays obtained for this study were of the elbows.

In order to study patterns of the bone hypertrophy we have developed a computer technique for displaying points measured from the two x-ray projections. Measured points were printed out to represent the humerus at a specific level in cross-section. The points were connected with curves to outline both the medullary and external surfaces of the bone (Figure 7). This technique graphically demonstrates hypertrophy of bone on the playing side, showing both a decrease in medullary cavity width and an increase in full humeral diameter in the individual shown. The patterns of bone hypertrophy are the subject of ongoing research.

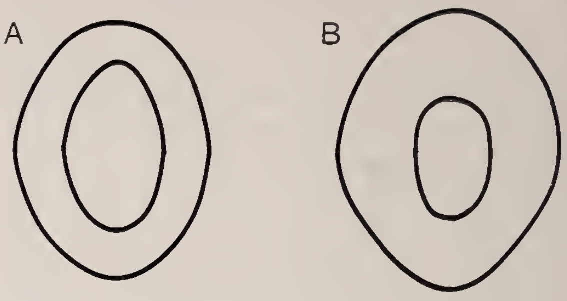


Fig. 7—Curves outlining computer projection of humeri in cross-section. Non-playing (A) and playing (B) humeri of a 29-year-old male with 22 years of playing experience. Bone was increased by 88 percent on the playing side in this particular player. Photo, courtesy of Orthopedics Digest. (Permission Granted.)

Soft Tissue Changes

Muscular Hypertrophy

Measurement of the muscular layer and of the skin and subcutaneous tissue layer was performed on the Xrays also. Lateral forearm musculature revealed hypertrophy in the dominant extremities on the anteroposterior film (27 percent in females and 17 percent in males), while medial musculature in this projection showed surprisingly no increase. This is thought to be the inadequacy of the anteroposterior x-ray projection for this purpose, not a lack of flexor forearm muscular hypertrophy.

Skin and Subcutaneous Tissue Layer

While girths of the playing extremity were increasing, the skin and subcutaneous tissue layer was not. Seven of eight measurements revealed that this layer was narrower on the playing side, and five of these eight were significant to the $p = 0.015$ level or less. The mean difference in skin and subcutaneous tissue in the forearm was approximately 10 percent in the women and five percent in the men. This is, to the best of our knowledge, the first statistical demonstration that this layer, made up mostly of fatty tissue, may be diminished over an anatomical region of strenuous activity, even though it be a single extremity. The significance of this finding is currently under consideration.

References

1. Garn SM: Orthop Clin North Am 3:3:503, 1972.
2. Nilsson BE and Westlin NE: Clin Orthop 77:179, 1971.
3. Dalen N & Olsson KE: Acta Orthop Scand 45:170, 1974.
4. Priest JD et al.: J Sports Med 2:3:137, 1974.
5. Chinn CJ et al.: J Physical Therapy 54:5:474, 1974.
6. Priest JD et al.: Orthop Digest 3:8:9, 1975.
7. Middleman IC: Amer J Surg 102:627, 1961.
8. Tullos HS & King JW: JAMA 220:264, 1972.
9. Hollinshead WH: Textbook of Anatomy, Harper and Row, New York, 1962.
10. King JW et al.: Clin Orthop 67:116, 1969.
11. Jones HH et al.: J Bone and Joint Surg 59-A(2):204, 1977.
12. Meema HE & Meema S: J Am Geriatr Soc 11:1170, 1963.
13. Bloom RA & Laws JW: Br J Radiol, 43:522. 1970.

Primary Benign Solid Tumor of the Mesentery

J. BONELLO, M.D.;* L. SCHULTZ, M.D.;* and J. P. DELANEY, M.D.*

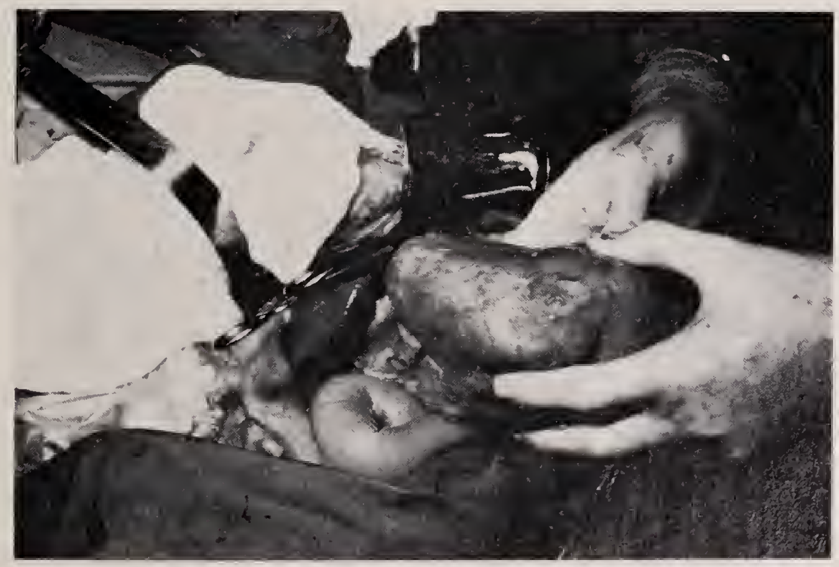
A case report of a solid primary tumor of the mesentery in a 43-year-old woman is presented. These rare tumors of the mesentery, because of their peripheral position, attain a large size before they become symptomatic. Symptoms, secondary to mechanical obstruction, are nonspecific, consisting of "gaseousness," vague abdominal discomfort, dyspepsia and sometimes constipation or diarrhea. The physical findings are that of a large, palpable, nontender abdominal mass, characteristically movable from side to side but not up and down. The only treatment is total en bloc surgical excision.

A TUMOR ORIGINATING from the mesentery was first described in 1507 by Benivieni, a Florentine anatomist, who found a cyst originating in the small bowel mesentery at autopsy.[1] Fewer than five hundred such mesenteric lesions have been reported in the world's literature. Of these, solid primary tumors of the mesentery represent approximately 10%. Yannopoulis and Stout[2] in a meticulous review of the literature listed 35 previous case reports and added 12 of their own. Since then four more have appeared.

A large mesenteric fibroma was removed recently at this institution.

Case Report

A 43-year-old white female was referred for evaluation of a large left upper quadrant abdominal mass which she had first felt shortly before admission. The patient was asymptomatic except for slight abdominal fullness after eating. She denied other gastrointestinal symptoms. Gallbladder and upper gastrointestinal Xrays



Figure—The tumor has been freed from diaphragmatic attachments. It was fixed to the spleen and the tail of the pancreas. The splenic flexure of the colon was enveloped by the lesion.

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done in 1969 to investigate epigastric discomfort had been reported as normal and the patient was subsequently treated for "functional" GI distress.

Review of systems elicited occasional tension headaches relieved by aspirin and rest. The patient was gravida, para 7-0-0-6 and had a small cervical polyp cauterized nine months before. Pap smear at that time was normal. She testified to occasional ankle edema for many years and had taken diuretics as needed. The patient gave a history of "arthritis" since the age of 21; but took no aspirin and had no joint deformities.

Family history included one child dying of leukemia, and one with a benign brain tumor removed in 1972.

The patient's past medical history included surgical removal of a left axillary mass of unknown character 20 years before and several breast fibroadenomas.

On admission the patient had a blood pressure of 156/90 with a pulse rate of 80. Physical exam was essentially normal except for scars on both breasts from previous operations. The abdomen was soft with no distention. A large, firm mass was noted in the left upper quadrant almost reaching the umbilicus. The mass moved with respirations and there was minimal tenderness at its inferior border. On pelvic exam a 2-3 cm firm mass was found in the right anterior uterus. No adnexal abnormalities were noted.

An extensive laboratory and radiologic workup was undertaken with the following findings: Chest Xray was normal except for granulomas in the left perihilar area. Intravenous pyelogram revealed a soft tissue density in the left flank which did not displace the left kidney and bilateral normal renal function. An abdominal echogram showed a large transonic mass which was contiguous with the spleen and appeared to have a dumbbell shape. Two solid tissues that are seen as transonic are lymphomas and fatty tumors, such as liposarcoma. Barium enema revealed a large mass associated with the splenic flexure displacing the left transverse colon anteriorly and the proximal descending colon posteriorly. It appeared to efface the colon; mucosal defects and ulceration could not be excluded. Lymphosarcoma or a pancreatic mass were considered the most likely diagnoses. Upper gastrointestinal studies with small bowel follow through demonstrated an extrinsic mass without infiltration of stomach or small bowel. Liver scan was normal. All hematology and blood chemistry results were within normal limits.

At laparotomy a large mass was found in the left upper quadrant surrounding the splenic flexure of the colon and attached to the spleen, left diaphragm, and tail of the pancreas (Figure). A small piece of diaphragm, the spleen, the splenic flexure of the colon, and tail of the pancreas were resected with the mass. Several lymph nodes were removed from the periaortic area and a liver biopsy was done. A primary anastomosis of the colon was performed. The remainder of the abdomen was normal to palpation except for a uterine myoma. The diaphragm and abdomen were closed without drains or chest tubes.

The pathologist's impression on frozen section was leiomyosarcoma. Numerous permanent sections of the tumor were examined but no malignancy was identified. The final diagnosis was fibromatosis of the mesentery. The specimen weighed 1,300 gm and measured 18 x 17 x 10 cm. Review of Xrays taken in 1969 gave no indication of the presence of a tumor at that time. The left axillary mass removed in 1952 was re-examined and identified as axillary breast tissue.

The patient did well postoperatively and was discharged ten days later. One year later she was asymptomatic and had no physical evidence of abdominal masses.

Discussion

The earlier case reports, although historically interesting, fail to provide histologic insights.[3] However, one fact stands out from these reports and that is that all these solid tumors were large, usually 10-20 cm, the largest being 50 cm in diameter.[4]

The most common tumors of the mesentery are metastatic implants either from intra-abdominal or pelvic tumors.[5] Primary tumors are rare; these cystic growths occur more frequently than solid tumors in a ratio of 2 to 1. Of the solid tumors (lipomas, fibromas, fibromyomas, leiomyomas, neurofibromas, and their malignant counterparts) benign lesions are more frequent than malignant. According to Yannopoulis, fibromas are the most common, solid, primary neoplastic tumors.[2]

Most fibromas occur in the mesentery of the small bowel, with the highest frequency in the ileal mesentery. Occasionally, they are found in the gastrohepatic mesentery or mesocolon, as in the present case. The peripheral location probably accounts for the usual large size of the tumors before they become symptomatic. Such fibromas may be associated with familial polyposis, osteomas, epidermoid cysts, subcutaneous fibromas, and Gardner's syndrome. Although fibromas are well encapsulated, they may involve surrounding tissues as in the case reported here.

One half are asymptomatic.[6] Possible symptoms depend on size, location, and mobility of tumor. They do not present characteristic clinical findings. In the early stages, they are asymptomatic and when discovered usually measure 10-20 cm in diameter. Then symptoms of mechanical pressure develop (vague pain, diarrhea, weight loss, abdominal discomfort, dyspepsia, gaseousness, constipation, and sometimes nausea and vomiting). Rarely, the patient presents with symptoms arising from the tumor itself such as torsion or infarction of the mass.

The differential diagnosis must take into consideration all tumefactions, both of the abdominal cavity and retroperitoneum.

The only treatment for both benign and malignant tumors is surgical excision. Tumors should be removed en bloc because of: (1) local recurrence, (2) the question of benign versus malignant, (3) compromised blood supply of remaining organs, and (4) possible malignant degeneration. Prognosis after excision is excellent.

References

1. Schwartz SI, Lillehei RC, Shires GT, Spencer FC and Storer E.: Principles of Surgery, New York, McGraw-Hill Book Company, p. 1334, 1974.
2. Yannopoulis K and Stout AP: Primary solid tumor of the mesentery. Cancer 16:914, 1963.
3. Vance J: Solid tumors of the mesentery: with report of case review of literature. Ann Surg 42:366, 1906.
4. Shepherd FJ: Successful removal of enormous mesentery tumor and nearly eight feet of intestine. Br Med J 2:966, 1897.
5. Adams JT and Kutner FR: Pure fibroma of the mesentery. Am J Surg 111:734, 1966.
6. Phole von EE: Rare tumors of the GI tract. Am J Proct 15: 311, 1964.

In Memoriam

Robert Hebbel, M.D.—(1906-1977)

Robert Hebbel, Professor emeritus of the Department of Pathology, University of Minnesota died at the age 70 from malignant lymphoma on January 30, 1977.

A native of Minnesota, Dr. Hebbel took all of his college and professional training at the State University and received his M.D. degree in 1933. After several years in private practice he entered the graduate school at the University of Minnesota in 1937, obtaining his PhD. degree in 1942. He was immediately called into the army and served his Country until 1945 when he returned to the Medical School. His rise through the academic ranks was rapid and he became a full professor in 1952—a position he held until his retirement from the University on June 30, 1975. Thereafter, he continued to teach until shortly before his death by joining the University affiliated staff of Miller Hospital in St. Paul.

Dr. Hebbel's special interest was in the field of surgical pathology. His forte was in the teaching of residents where there was a one-to-one relationship with the student. He could bring the subject alive and generate a real feeling of excitement. His careful attention to gross detail and thoughtful deliberations on the most routine cases were always models for the students to follow. Far beyond this was his vast knowledge of anatomic pathology based on extensive reading and his ability to recall and collate information from similar cases that he saw in a large University and private practice. He rapidly became the recognized authority for the University. As his students left for other parts of the Country they continued to send difficult cases back to Dr. Hebbel for his evaluation and his reputation was established throughout the United States.

His interest in pathology remained catholic and his advice was highly respected in all matters concerning the entire discipline. He served as officer and president of the various state pathological societies and remained a continuing counselor to the Minnesota Society of Clinical Pathologists throughout his academic career.

To those who knew him as a friend he had a warm personality with a good sense of humor and always was willing to assist when possible with any type of problem, professional or personal, that came to his attention. His colleagues feel a deep sense of loss for a trusted counselor and a warm friend.

John I. Coe, M.D.
Minneapolis, Minnesota

Case Report

Pneumatosis Cystoides Intestinalis in Childhood Systemic Lupus Erythematosus

D. H. BINSTADT, M.D.* and P. R. L'HEUREUX, M.D.*

A fifteen-year-old white female with systemic lupus erythematosus and complicating pneumoperitoneum secondary to pneumatosis cystoides intestinalis is reported. This is the first account of this association in a pediatric patient. A brief review of the literature is presented.

ALTHOUGH PNEUMATOSIS CYSTOIDES intestinalis (P.C.I.) has been described in association with dermatomyositis, scleroderma, and juvenile rheumatoid arthritis, it has only recently been documented in an adult patient with systemic lupus erythematosus (S.L.E.).[1] To our knowledge, this association has not been noted in the pediatric population. This paper details the clinical, radiographic and pathologic findings in a teenage female with S.L.E. who developed P.C.I. and a complicating pneumoperitoneum.

Case Report

A patient presented in 1971, at age 11, with a two month history of multiple joint pains and fusiform swelling of fingers thought to be due to juvenile rheumatoid arthritis. A 21-year-old sister had S.L.E. and was doing well. Aspirin therapy provided early relief, but one year later she was hospitalized with anemia, arthralgia, sinusitis, and dyspnea. Rheumatoid factor and LE clot tests were both positive. Steroid therapy was initiated with marked relief of symptoms. Three years later she was readmitted with progressive azotemia, hematuria, and proteinuria. Cytoxan therapy was started at this time; one month later she was again hospitalized for pneumonia and pancreatitis, at which time her blood pressure was 140/100 and cotton-wool patches were noted on fundoscopic exam.

She was admitted to the University of Minnesota Hospitals for the first time on June 10, 1975 with complaints of a skin rash and foot ulcers of four months duration. She was a chronically-ill appearing female with multiple areas of erythema and cutaneous atrophy on her hands, feet, and legs. Her blood pressure was 150/120; peripheral pulses were absent in the lower extremities.

Her hospital course was progressively downhill and was marked by intermittent bouts of emesis, diarrhea, and abdominal pain which recurred throughout her hospital stay. Pancreatitis was suspected because of malabsorption and an elevated urinary amylase. Progressive hypertension and compromised renal function necessitated the addition of Aldomet, Inderal, and Furosamide to the Cytoxan and steroids.

Because of increasing abdominal pain and Guaiac positive stools, a contrast study of the upper gastrointestinal tract was done on July 16. Extensive P.C.I. and a large pneumoperitoneum were demonstrated, but without evidence of perforation (Figure 1). At exploratory laparatomy the next day, air was seen in the retroperitoneal space and mesentery, and pneumatosis was found in the stomach, duodenum, small bowel and colon. There was no evidence of bowel perforation.

Her postoperative course was complicated by uncon-

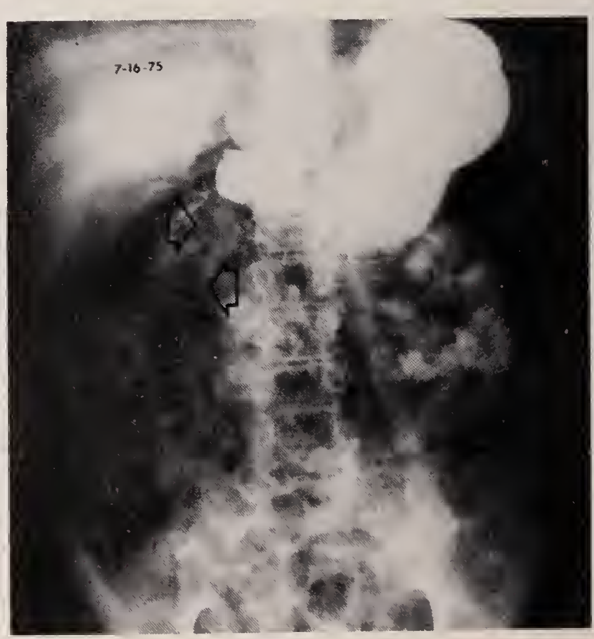

Fig. 1—Overhead film from an upper gastrointestinal series reveals massive pneumatosis cystoides intestinalis, particularly in the right upper and right lower quadrants (arrows).

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trolled hypertension and fluid and electrolyte imbalances, but subsequently gastrostomy feedings were well tolerated. On August 25th, P.C.I. was again seen on a roentgenogram of the abdomen (Figure 2). She complained of abdominal pain at this time, but the physical examination remained unremarkable. On August 29 progressive dyspnea, oliguria, and tachycardia required nasotracheal intubation, oxygen, vasopressor agents, and diuretics. The patient died on August 31, 1975. At autopsy pneumatosis was found in the cecum and ascending colon. There was no evidence of any vascular lesions, nor were there any perforations of the bowel.

Discussion

Pneumatosis cystoides intestinalis is characterized by cystic air collections in the submucosal or subserosal layers of the bowel wall. These cystic structures may vary greatly in size and in distribution. They probably consist of encysted nitrogen (70-90%), oxygen (3-20%), and CO_2 (2-15%).[2] The cell type which lines the cystic structures is now believed to be a phagocyte with positive "PAS" staining characteristics, and not an endothelial cell of lymphatic origin as was formerly believed.[3]

Two broad types of pneumatosis cystoides intestinalis have been described, the primary or idiopathic type and the secondary type which may have numerous causes including: mechanical bowel obstruction, neoplasms, sigmoidoscopy,[4] drugs,[5] infection,[6] emphysema,[7,8] and vascular insufficiency.[9] P.C.I. has been described in a number of collagen diseases: particularly scleroderma[10-13] and dermatomyositis,[13,14] and rarely in juvenile rheumatoid arthritis.[6] A primary type of P.C.I. was recently reported in an adult patient with S.L.E.[1]: the authors stressed that P.C.I. does not necessarily imply a grave prognosis. We have not found any report of the association of P.C.I. and S.L.E. in the pediatric age group.

When P.C.I. is discovered in a patient with an underlying collagen disease, every attempt must be made to determine its etiology and to evaluate its clinical significance. Upper gastrointestinal examinations with water soluble contrast agents may be required to rule out enteric perforations in those patients who progress to a pneumoperitoneum. Some patients with P.C.I. develop a pneumoperitoneum without a perforation of the bowel, and follow a relatively benign course; in others, however, P.C.I. heralds a major intestinal catastrophe. Only careful clinical and roentgenographic evaluation will distinguish these two groups of patients. The distinction is of obvious importance since the added stress of surgery may be avoided in these often critically-ill patients.

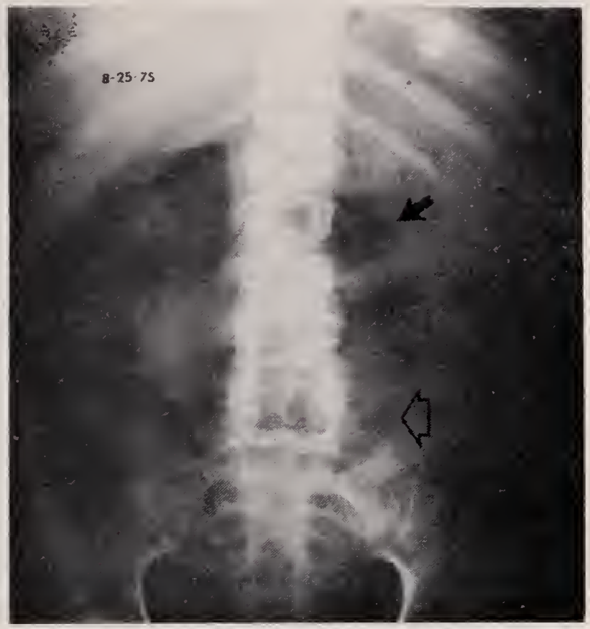

Fig. 2—A roentgenogram of the abdomen demonstrates recurrent pneumatosis in the ascending colon and other bowel loops. The arrows indicates the typical linear appearance of intramural air in the bowel wall.

Acknowledgment

We are grateful to Ms. Susan K. Hagen and Ms. Jean Dores for their assistance in the preparation of this manuscript.

References

1. Freiman D et al.: Pneumatosis intestinalis in systemic lupus erythematosus. Radiology 116:563, 1975.
2. Cook CD et al.: S.L.E.: Description of 37 cases in children and a discussion of endocrine therapy in 32 of the cases. Pediatrics 26:570, 1960.
3. Elliot GB and Elliot KA: The roentgenologic pathology of so-called pneumatosis cystoides intestinalis. Am J Roentgenol 89.720, 1963.
4. Marshak RH et al.: Pneumatosis involving the left side of the colon. JAMA 161:1626, 1956.
5. Jacobs JC: Systemic lupus erythematosus in childhood. Pediatrics 32:257, 1963.
6. Seaman WB et al.: Pneumatosis intestinalis of the small bowel. Semin Roentgenol 1:234, 1966.
7. Doub HP and Shea JJ: Pneumatosis cystoides intestinalis. JAMA 172:1238, 1960.
8. Keyting WS et al.: Pneumatosis intestinalis: A new concept. Radiology 76:733, 1961.
9. Rigler LG and Pogue WL: Roentgen signs of intestinal necrosis. Am J Roentgenol 94:402, 1965.
10. Gompels BM: Pneumatosis intestinalis associated with scleroderma. Br J Radiol 42:701, 1969.
11. Meihoff WE et al.: Small intestinal scleroderma with malabsorption and pneumatosis cystoides intestinalis. JAMA 204:854, 1968.
12. Miercort RD and Merrill FG: Pneumatosis and pseudo-obstruction in scleroderma. Radiology 92:359, 1969.
13. Mueller CF et al.: Pneumatosis intestinalis in collagen disorders. Am J Roentgenol 115:300, 1972.
14. Oliveros MA et al.: Pneumatosis intestinalis in childhood dermatomyositis. Pediatrics 52:711, 1973.

Special Article

Electrotherapy and Renal Transplantation — Impediment To Treatment

IRVING C. BERNSTEIN, M.D.,* DOROTHY M. BERNSTEIN, M.D.* and
GEORGE R. ADZICK, J.D.†

Because of the recent emphasis on the rights of the individual, patients now realize they have the right to refuse treatment prescribed for them. Patients and their families also react strongly to the misconceptions in the mass media including television, newspapers, and movies that electric treatments are being used as a threat or punishment in some treatment facilities.[1-3] This has resulted in conflicts in psychiatric practice especially in two areas: (1) in regards to involuntary hospitalization and (2) in regards to the use of electric treatment in committed patients.

The controversy had become so polarized that the courts became involved. The Minnesota Supreme Court on February 20, 1976, rendered a decision in Price vs. Sheppard[4] that all committed patients must have court approval before electric treatments can be administered against the patient's will. The court stated court approval must be attained in order to administer "intrusive treatments" which it did not clearly define except to include psychosurgery and electrotherapy which it defined as "not cruel and inhuman treatment or a constitutional invasion of the right to privacy."

Most psychiatrists consider electrotherapy to be an established modality of treatment to be utilized when indicated. Arndt[5] states: "Thirty years of experience with electrotherapy has shown that certain mental illnesses are routinely benefited." Adren[6] states: "Extensive experiences with electrotherapy modified or unmodified, have borne out complete recovery in numberless cases." Freedman and Kaplan[7] in their *Comprehensive Textbook of Psychiatry* write "The effect of electrotherapy in depression is one of the most spectacular treatments in medicine."

Notwithstanding all of this information regarding the efficiency of electrotherapy more and more restraints are being recommended by various groups to prevent psychiatrists from treating their patients with electrotherapy. The groups have included the lay public, the courts, paramedical personnel, and other psychiatrists. This paper describes still another source.

The clinical psychiatrist is guided by evidence and experience which has demonstrated the efficacy of specific treatments in alleviating certain conditions. Some psychiatrists consider electrotherapy to be the treatment of choice for severe depressions associated with suicidal threats and involutional melancholia.[7] Other psychiatrists[8] utilize electrotherapy only after treatments such as psychotropic drugs and psychotherapy have been unsuccessful in alleviating the patient's affective symptoms. Still other psychiatrists for sometimes unstated reasons never use this modality.

In the Price vs. Sheppard[4] Case, a 17-year-old boy was committed to a Minnesota State Hospital by a county probate court in 1971 after being found to be "mentally ill—inebriate." After an attempt to assault a staff member, he was transferred to the Minnesota State Security Hospital where he was diagnosed schizophrenic. Because he failed to respond to drug treatment and continued to be assaultive and aggressive to the staff members and other patients, the medical director prescribed electrotherapy. The patient's mother refused consent. Three months later and with the recommendations of a psychiatric consultant, the treatments were given without her consent because of the patient's lack of improvement. Subsequent to the patient's discharge in 1972 the mother sued the medical director and the State Security Hospital for $18,000. She lost in the lower court but appealed to the Minnesota State

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†Referee in Probate of Hennepin County Probate.

Supreme Court which ruled for the medical director declaring that the State has a duty to protect the well being of its citizens who are incapable of acting for themselves.

As a result of the "Price Decision" and its interpretation by a hospital and its attorney, the following case of a severely ill patient—both mentally and physically—was unduly delayed and could have ended in death as occurred in a case of food refusal in a 49-year-old female reported by Treffert.[9] "She refused voluntary psychiatric intervention and, in spite of her frail and deteriorating condition, insisted on leaving the hospital. Her family and physician petitioned the court for psychiatric observation of the patient. The judge believed, however, that the situation lacked dangerousness in an immediate or imminent sense, and the patient therefore failed to qualify for involuntary commitment. She was sent home, as she desired, and three weeks later she died from inanition."

The present case is a 24-year-old single nurse who had received a living related donor kidney allograft from her brother in the fall of 1975. Because of her autistic thinking and refusal to eat and to take her immunosuppressant medications she was referred to one of the authors who made a diagnosis of schizophrenia and referred her for inpatient psychiatric care. On admission she was mute, resistant, and delusional. A diagnosis of schizophrenia with catatonic withdrawal was made and electric treatments prescribed. The parents were agreeable but the patient would not give her consent.

The legal process was instituted to obtain court approval for electroconvulsive therapy. Because of the seriousness and uniqueness of the situation —i.e. food and medication refusal and catatonic schizophrenia in a transplanted patient—her care was discussed with accepted medical authorities who had extensive experience in renal transplantation, schizophrenia, and endocrinology. It was their opinion that the patient's psychiatric illness had to be treated with electrotherapy to preserve her life. The successful use of electrotherapy in renal transplanted patients with mental illness was substantiated in a not yet published report from Duke Medical Center.[10]

The court was contacted by phone and the verbal opinion was given to proceed with electrotherapy if there was a medical emergency but that medical justification would have to be demonstrated at the time of the court hearing. The hospital administration was advised of this but refused to permit the administration of electrotherapy because one of the hospital medical consultants felt it was not a medical emergency even though he agreed the patient was catatonic. He felt the immunosuppressant drugs could be given intravenously or with encouragement.

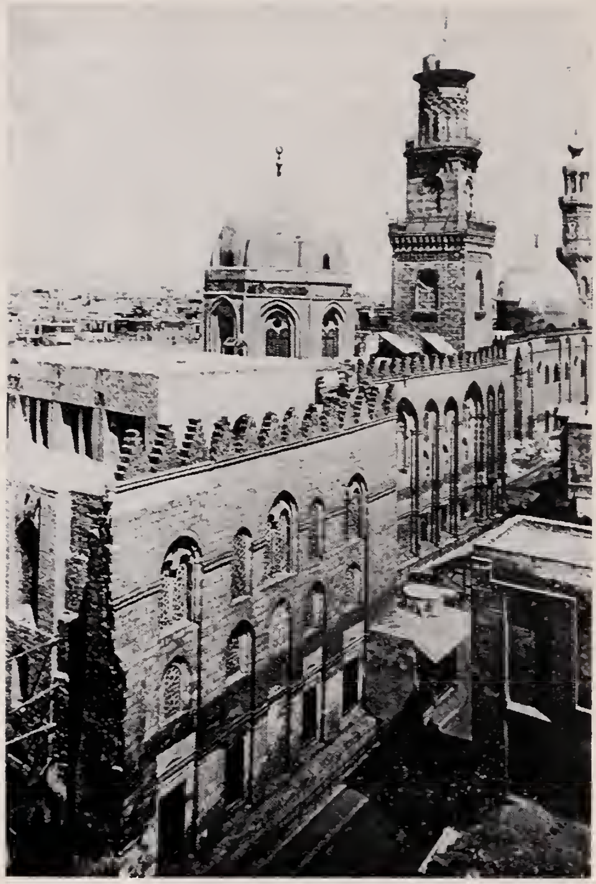
The immunosuppressant drugs were given orally although it sometimes took over an hour per dose of the nurse's time. The patient took very little nourishment and fluids. During this interval the patient's family became increasingly concerned that appropriate treatment was being withheld and that the patient might die.

The court convened ten days after the patient's admission and permission was given to proceed with electrotherapy immediately. The court stated that there was evidence of a dire emergency as substantiated by the contents of the medical record and the testimony of the attending physician, the petitioner, and the guardian ad litem and ordered the treatment recommended by the patient's doctor. After one electric treatment the patient voluntarily began to eat and accept her life saving drugs. She received a total of four electric treatments and was discharged home to her parents only 15 days after electrotherapy was started.

This case illustrates another example of interposition between a psychiatrist and a patient, namely hospital administrators who probably are reacting more to the treatment modality and fears of litigation rather than the patient's rights. It is doubtful that administrators would prevent doctors from using an electro stimulator on this patient without her permission if she developed a cardiac arrhythmia.

This case is presented in order to demonstrate the life saving value of electrotherapy in selected cases and to show the problems related to its use because of unfounded prejudice. Procedures must be established in hospitals so that patients are not prevented from obtaining "their right to proper treatment."[11]

References on page 428.



Historical Hospitals

Constructing the Sultan Qalaun's Hospital

Remains of the Sultan Qalaun's complex. Much of the hospital was destroyed in 1910 to make room for the Ophthalmic Hospital. Courtesy K.A.C. Creswell and Clarendon Press, Oxford.

The Sultan Qalaun, apparently an impatient man, built in a single complex a hospital, collegiate mosque, and his own tomb, all within the space of eleven months in the year 1284 A.D. The mosque and the tomb still stand at Cairo, showing a strong European influence which has been likened to the twelfth-century architecture of Norman Sicily.

At a furious pace dictated by the sultan, three hundred prisoners transported pillars of granite and marble as well as fine marble panels from the ruins of a palace on Roda Island. No other construction was allowed during this time so that all of Cairo's skilled workers would be available for the project. Mamluks posted in the street forced casual passers-by to carry stones and otherwise help while the over-seer, an emir, stood on the scaffolding with a rhinoceros-hide whip to encourage diligence.

Naturally such heavy-handed methods aroused considerable resentment which was expressed publicly by jurists and religious authorities. The sultan, looking to his popular image, resurrected a fanciful story used earlier by another ambitious Arab builder: he circulated a rumor that workmen excavating for the building had happily uncovered sealed boxes of jewels and coin in sufficient quantities to defray the cost of the entire project. Despite the purported evidence of Allah's favor and the easing of the taxpayer's burden, the agitation subsided slowly. The most prominent religious leader of the time long refused to deliver the inaugural sermon, and when he finally consented, his address included bitter reproaches against both the sultan and the emir.

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References

1. Creswell KAC: The Muslim Architecture of Egypt II, The Clarendon Press, Oxford, 1959.
2. Margoliouth DS: Cairo, Jerusalem, and Damascus, Dodd, Mead, Co. New York, 1912.

Editorials

Family Practitioner in a Multispecialty Clinic*

CONGRATULATIONS TO the St. Louis Park Medical Center for demonstrating that the twentieth American medical specialty, Family Practice, can co-exist and flourish with other medical specialists.

This mutually beneficial arrangement has worked and thrived in hundreds of hospitals with multi-specialty staffs, where it has been allowed to occur. Many an observer has remarked that the strongest and most vigorous hospitals are the ones that contain an active family practice section. It would seem logical that this could carry over to a large clinic such as the St. Louis Park Medical Center.

The goal of the American Academy of Family Physicians is 25% of all medical graduates choosing family practice as their specialty. Hopefully the St. Louis Park Medical Center will achieve this ratio soon.

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*von Weiss, David L.: Does Family Practice Work in a Multispecialty Clinic. Minnesota Med. 60:5:344, 1977.

Hypertension:

Maintenance Therapy and the Enigma of Compliance

DR. DAHL'S* REPORT in the May issue is one of many that has appeared in recent years emphasizing the hazards of untreated hypertension. Over the past decade, findings from several prospective studies have served to underscore the contribution of hypertension to cardiovascular morbidity and mortality.[1] Although recent studies would indicate that there seems to be little doubt regarding the benefits of treatment,[2,3] the practical problems of long-term control of blood pressure are far from resolved.

The author's experience with a group of patients screened at several medical clinics represents an example of an affirmative response to a contemporary medical challenge. The information presented suggests that during the initial 18 months of the author's study, 257 patients seen at five clinics entered the management program. Of this group, 70.8% of the blood pressure readings were reported as stable or reduced and remained in a satisfactory range. Unfortunately the limited data presented do not permit us to examine subsets within the cohort. The central theme of the author's mission is to argue persuasively against

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*Dahl JC: Rational Management of Hypertension. Minnesota Med 60:5:311, 1977.

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therapeutic nihilism and to suggest that compliance to management programs is best achieved by a conjoint effort of a physician and nurse, congruent in their management approaches, the latter trained in long-term maintenance therapy of the chronically sick.

The model presented by the author underscores the value of long-term therapy and inferentially suggest an increased acceptance of the varying nurse-physician mix by the patients. The suggestion is made that a well-trained nurse is better able to motivate a patient than the average physician. Unfortunately in making this observation the author's model provides for no controls. While we are supportive of the notion that innovative health care models must articulate their interim results, it seems pertinent to suggest that the relative contributions of the professional manpower mix in an ambulatory care setting bear need for systematic study. Given the primitive state of the art in evaluating health care models, the challenge indeed is real. As an example, the use of blood pressure levels as an outcome indicator is fraught with the hazards of inaccurate extrapolation. It is well known that declines in grouped blood pressures occur in significant numbers even *before* a formal intervention program is instituted.[4] It becomes necessary, therefore, to examine model effectiveness against the background of regression and placebo effects. Even more critical is the close examination of the seemingly well educated but persistently recalcitrant individuals. These subsets, in whom gains are not easily made, are central to the problem of model effectiveness since the cost-benefit tradeoffs are different in groups that repudiate motivation. Indeed, this noncompliant group may be at a relatively greater health risk than those who readily comply to therapy. The more significant cost investments also occur at this frustrating tail end of the compliance curve.

Increasingly the concept of effective health education cuts across intervention efforts in hypertension control programs. The immediate aim of education is to enhance compliance to therapeutic regimens. Yet a closer scrutiny of this alliance suggests that there may be fragile links in the bond. In several studies the effects of information, teaching, and health education are variable.[5] In fact, there is not a priori reason to expect a consistent causal relationship. Furthermore, little information is available concerning optimal educational methods. Single intervention, multiple reinforcements, fear arousal, and mass versus face-to-face approaches are among the methods suggested by various authors, but we have inadequate information on how effective and sustained any of these discrete motivational models really are. The Stanford Heart Disease Prevention Program has demonstrated some impact on risk factor reduction in communities by mass persuasion.[6] Among the early results of the Stanford Study added gains occur when mass persuasion is combined with personal contact. Who then should provide such reinforcement? Initial two-year rescreen data from the Three-Community Southeastern Minnesota Study, in a pre test-intervention-post test design, suggest that solo and small group practices are apparently as effective in demonstrated blood pressure declines as is an intensive nurse motivational program.[7] These latter observations in rural communities are intriguing and suggest that a plurality of organizational approaches may lead to similar end results.

We raise these issues not to diminish the validity of the author's conclusions but rather to emphasize the need for a multifaceted examination of any innovative health care model. The questions confronting American medical care relate not only to model effectiveness but also to the efficiency of developing subsystems. We must concern ourselves with the evaluation of a system as it relates to quality, accessibility and cost effectiveness of care that is provided. If direct patient care responsibilities are increasingly assumed by nonphysicians, the implication of these expanded roles requires careful reappraisal of overall manpower needs for the country. The ripples of positive conclusions are rapid in their spread; when such approaches suggest an augmentation of professional manpower hierarchies under the medical panoply, we need to pause and pose some difficult questions. As a case in point, current information suggests that patient noncompliance is markedly influenced by economic barriers.[8] Are the suggested motivational strategies equally applicable to all demographic and socioeconomic groups? Will the models be responsive to evolving technologies? Will educational reinforcement hold out consistently against structural variables such as costs of drugs regimen, complexity of therapeutic approaches, and the interactive effects of drug reactions? And finally, does the model for hypertension demand development of several single-factor intrusive management strategies for alcoholism, obesity, smoking, or congestive heart failure, independent of or integrated into the traditional template of medical care? Will all this cumulatively enhance or decrease the final costs of ambulatory medical care?

We believe these are important and unanswered issues. The summarization of one more experience in hypertension control presented in this journal provides a fruitful initial approach to long-term management of hypertension. Against the epidemiologic backdrop of significant risks of untreated hypertension the author's stated gains are commendable. This and other encouraging signals of progress across the nation suggest that concerted efforts may yield dividends in some chronic disease states. Indeed, it seems likely that well organized care for hypertensive disease can have a salutary effect on access and outcome. However, before we propose a final agenda for the future, we need to reconcile the conflicting evidence concerning compliance, examine conterminous professional roles and carefully assess the looming concerns regarding real health manpower needs for the coming decade.

Iqbal Krishan, M.D.
James C. Hunt, M.D.
Rochester, Minnesota

References

1. Paul O: A survey of the epidemiology of hypertension; 1964-1974. Mod Conc Cardiov Dis 43:99, 1974.
2. Veterans Administration Cooperative Study Group on Antihypertensive Agents: Effects of treatment on morbidity in hypertension: results in patients with diastolic blood pressures averaging 115-129 mm. Hg. JAMA 202:1028, 1967.
3. Veterans Administration Cooperative Study Group on Antihypertensive Agents: Effects of treatment on morbidity in hypertension II. Results in patients with diastolic blood pressure averaging 90-114 mm Hg. JAMA 213:1143, 1970.
4. Carey RM, Reid RA, Ayers CR et al.: The Charlottesville Blood-Pressure Study: value of repeated blood-pressure measurements. JAMA 236:847, 1976.
5. Sacket DL, Haynes RB: Compliance with Therapeutic Regimens, John Hopkins University Press, 1976.
6. Meyer AJ, McAlister A, Nash J, MacCoby N, Farquhar JW: Maintenance of Cardiovascular Risk Reduction: Results in High Risk Subjects. Circulation 54:H-226, 1976.
7. Brennan LA, Mori HD, McEnaney JE, Timm ME: Southeastern Minnesota Rural Hypertension Program: Results at Two Years: National Conference on High Blood Pressure Control, Washington, D.C., 1977.
8. Brand FN, Smith RT, Brand DA: Effects of economic barriers to medical care on patient's noncompliance. Public Health Reports, 92:72, 1977.

Cover Photo

"Rainbow at Machu Picchu, Peru"

Dr. Harry W. Mixer, a Minneapolis radiologist, took the cover photo standing in the Inca ruins in the Andes, 8,000 feet above sea level. He used a Canon Camera and Kodachrome film. He and his wife were attending the North Central Medical Conference in Peru last February, and had gone on a side trip to Machu Picchu.

Dr. Mixer told the editors he loves to travel and documents all of his travels with these lovely colored slides. In addition he is a student of history and is particularly interested in cathedrals.

Change of Address

Please send in any changes in address to the Minnesota State Medical Association, 101 E. 5th St. #900, St. Paul 55101. The new 1977 roster is being assembled, and address changes should be listed.

Letters to the Editor

Sports Medicine

Dear Editor:

Dr. Anonsen's February editorial* points out a disturbing trend in athletics and sports medicine.

The traditional relationship of good health and good performance has been strained in recent years by such increasingly sophisticated training techniques as unphysiologic weight loss and the use of anabolic steroids. In Nordic skiing, which is my particular interest, blood doping (phlebotomy with later retransfusion) is much discussed at international events. All of these techniques place a premium on short term performance with little knowledge of or regard for long term effects on health.

As Dr. Anonsen discovered, physician opposition to these practices may simply result in changing physicians rather than practices. Hopefully, steps will be taken to prevent high school team physicians from being placed in a situation where his or her position may be threatened by their strict attention to the health of the athletes being served.

David Scott, M.D.
Abbott-Northwestern Hospital
Minneapolis, Minnesota

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*Page 73.

Microvascular Surgery*†

Dear Editor:

The purpose of this paper was to acquaint the readers of MINNESOTA MEDICINE with the possible clinical applications of a relatively new microvascular surgery technique. It was pointed out in the paper that the first step in getting set for this type of surgery is a laboratory facility to develop the technical skills for anastomosing small vessels. Clinically, this must be combined with judgment in case selection, execution of the surgery, and postoperative care. In regard to our experience here, the neurosurgeons have performed 70 microvascular procedures;14 replantation procedures have been performed on the upper extremity, six incomplete and eight complete. Of the eight complete, a satisfactory result was obtained in five cases of which three involved thumbs and two fingers. To date we have done no free flap procedures in humans. When we became interested in this a couple of years ago, we thought there would be more candidates for free flaps but during the same time we have continued to develop and utilize muscle and myocutaneous flaps which take care of many of the defects which we thought previously could only be handled by free flaps. Please refer to our paper on this in the February issue of the Journal of Plastic and Reconstructive Surgery. Thank you for your comments.

G. B. Irons, M.D.
John E. Woods, M.D.
Rochester, Minnesota

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*Microvascular Surgery, 60:1:27, 1977.
†Letter to the Editor, 60:3:180, 1977.

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Grand Rounds

Orthopedic and Pathologic Aspects of Paget's Disease

LOUIS P. DEHNER, M.D.,* JOHN T. ANDERSON, M.D.,† and DAVID BROWN, M.D.‡

DAVID S. BRADFORD, M.D. (Editor)#

Dr. Louis Dehner:

The disease entity which we know as osteitis deformans, a name applied originally by Sir James Paget in 1877, remains an etiologic and pathogenetic enigma.[29] Paget was reasonably convinced that the underlying process was inflammatory and, therefore, an "itis" of the bone. By following his original five patients, he recognized that significant deformity of the bones occurred, and he also became aware of another important complication of the disease, that being neoplastic degeneration or transformation of the bone. Two of his original five patients, all with widespread polyostotic involvement, developed sarcomas. Paget's disease does not represent a manifestation of the conventional types of parathyroid dysfunction. Serum calcium and phosphorus values are within "normal limits" even in the presence of severe, generalized disease. On the other hand, the serum alkaline phosphatase is invariably elevated, but urinary hydroxyproline excretion may represent a more accurate index of skeletal involvement and activity of the disease.[15] The dilemma of Paget's disease remains with us[29] and we are left with a bone disorder showing excessive rates of resorption and formation. Many of the orthopedic problems relating to Paget's disease are attributable to the poor structural organization of the newly formed bone.

Some of the cogent remarks about Paget's disease relate to the epidemiology, clinical features and morphological appearance.[14] The monograph by Barry entitled *Paget's Disease of Bone* is the single, most complete source of information.[2] It is known that Paget's disease affects individuals mainly of Anglo-Saxon derivation with the highest frequencies in Great Britain and Australia. Figures from post-mortem studies indicate that 3-4% of the general population are affected, but only a small percentage of individuals are symptomatic.[5] There is a predilection for axial skeletal involvement, especially the lumbosacral spine, pelvis, and skull. The facial bones, excluding maxilla and mandible, ribs, and the bones of the hands and feet are usually spared. A significant degree of variability exists in the extent of skeletal disease. Involvement may be limited to a single bone and may, on occasion, present a diagnostic problem. When multiple bones are affected, however, the roentgenographic diagnosis is generally quite reliable.

With these introductory remarks, Dr. Anderson will present the clinical history and roentgenograms of the first patient.

Dr. John T. Anderson:

A 51-year-old white male presented in October, 1971, with the complaint of stiffness in both hips and progressively increasing pain in the left hip. He stated that a diagnosis of Paget's disease of the pelvis and skull had been established approximately nine years earlier through roentgenographic changes. At that time, he had mild hip pain. The progressive nature of the symptoms had limited his range of walking to only four or five blocks. His normal daily activities including his occupation as a teacher had become increasingly compromised.

The physical examination revealed a healthy, robust 51 year old male with significant limitation of motion in both hips. In the left hip, there was a fixed flexion contracture of 50°; flexion, 80°; abduction, 0°; adduction, 0°; internal rotation,

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10°; and external rotation, 10°. A fixed flexion contracture of 30° was present in the right hip with further flexion to 100°; abduction, 0°; adduction, 30°; internal rotation, 10° and external rotation, 10°. Pertinent laboratory findings included a serum calcium of 9.3 mg/100 ml, phosphorous, 3.4 ml/100 ml and alkaline phosphatase 86 International Units (normal, 47-156 I.U.).

Roentgenograms of the pelvis, lower lumbar spine, and both femurs (head, neck and proximal shafts) revealed marked sclerotic changes (Figure 1). Thickening of the medial cortex and coarse trabeculation of the cancellous portion of the left proximal femur were also noted. Advanced degenerative changes were present in the left hip joint with narrowing of the joint space and medial migration of the femoral head. Similar but less advanced disease was present on the right side.

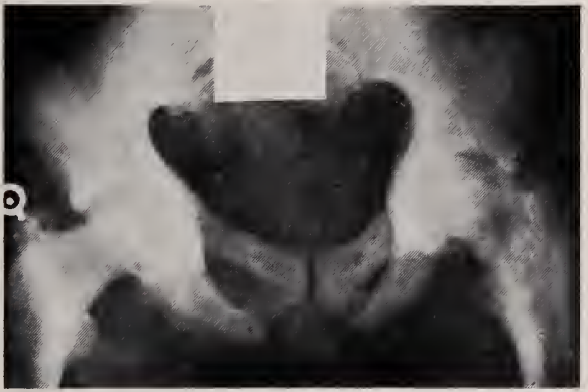

Fig. 1—Xrays of 51-year-old male with Paget's disease and pain in the left hip (10-22-71).

In November, 1971, a total hip arthroplasty (Figure 2) was performed on the left with some difficulty. Because thick, dense compact bone was encountered in the head and neck of the femur, a drill was required to create a medullary cavity to receive the stem of the femoral component. The specimen was sent to the surgical pathology laboratory.

Dr. Dehner:

First the gross features of the femoral head included the dimensions of 5.5 x 5.5 x 5.0 cm. There was irregularity of the articular surface created by focal erosion of the cartilage and eburnated bone. Most areas of the surface, however, were covered by intact articular cartilage. A large osteophyte was noted along the medial aspect of the femoral head corresponding to the roentgenographic change. The most impressive part of the gross examination occurred when the specimen was bisected with the bandsaw. There was considerable difficulty encountered in this maneuver because of the stone-like hardness of the bone. The bone in this case was extremely dense. Subchondral cysts were not identified. Multiple sections were examined microscopically after an inordinately long interval of decalcification.

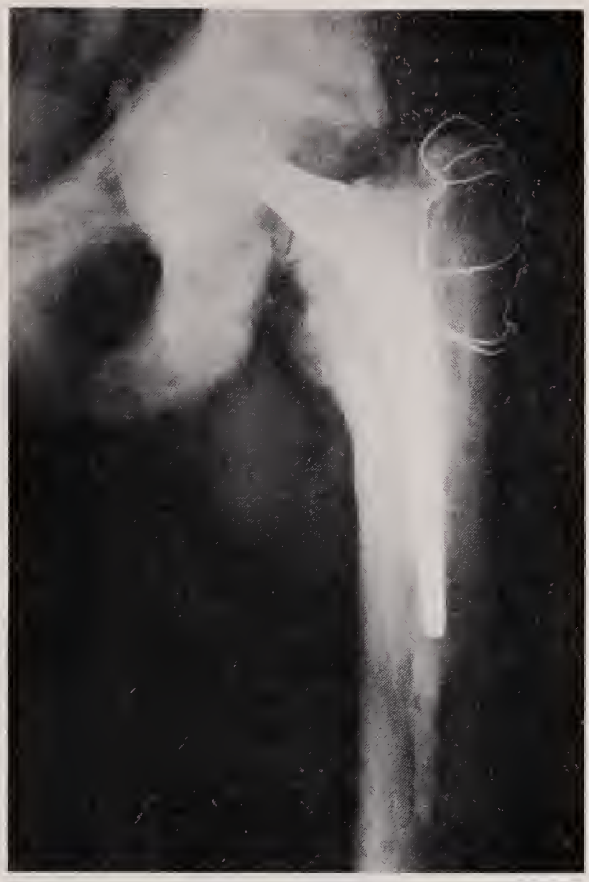

Fig. 2—Four years following total hip arthroplasty, the patient remains asymptomatic (10-16-75).

Histologically, the hyaline cartilage showed an overall reduction in thickness but only in a few central areas was actual eburnation identified. These latter foci were the ones where the subchondral bone was the most dense. However, in contrast to idiopathic osteoarthritis in the absence of Paget's disease, the subchondral bone in this case was more sclerotic in areas where the articular cartilage was normal. Vascularized connective tissue was present in the medullary spaces but cysts were absent. There was a moderate degree of osteoblastic activity with few osteoclasts. Cement or mosaic lines were prominent, as was osteoblastic and osteoclastic activity, in the irregular osseous trabeculae away from the subchondral zone.

Both osteoblasts and osteoclasts were noted along most trabeculae and the osteoblastic activity seemed to predominate (Figure 3). Although the diagnosis of Paget's disease was readily confirmed in this case, one potential area of difficulty should be commented on. Irregularly thickened or sclerotic bone showing osteoblastic activity is generally present in the subchondral area of idiopathic osteoarthritis. On occasion, faint mosaic lines are formed within the reactive bone. It is important for the pathologist not to over-diagnose Paget's disease when he sees these changes. There is no one histologic feature of Paget's disease that is pathognomonic of the disorder. Mosaic lines representing the "faceting" together of irregular osseous fragments are typically associated with Paget's disease, but they also occur whenever bone is rapidly turning over. Osteomyelitis, radiation osteitis, fibrous dysplasia, osteosarcoma and osteitis fibrosa cystica are some of the other disorders in which mosaic lines may be quite prominent. The classic paper by Jaffe[13] and a later discussion by Collins[6] are recommended as excellent sources on the pathologic anatomy of Paget's disease.

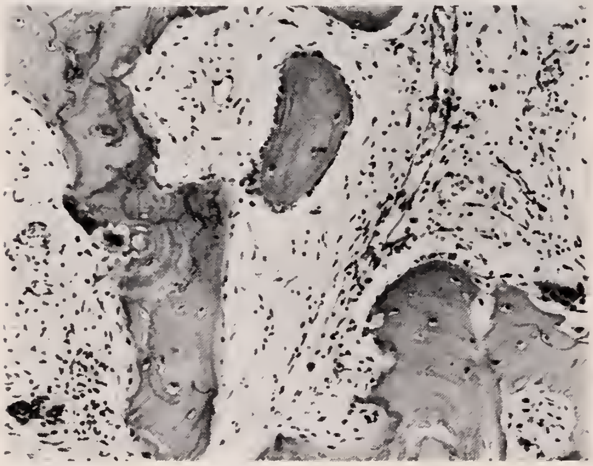

Fig. 3—Irregular osseous trabeculae with mosaic lines in an area of the femoral head away from the subchondral zone. Osteoblasts are quite prominent with focal multinucleated osteoclasts Hematoxylin and eosin, x 175).

Dr. Anderson:

Following his total hip replacement (Figure 2), the patient has done very well and is pleased with the results. It has now been four years since surgery and he remains quite active without pain, being able to swim, bowl, and play a full eighteen holes of golf. His range of motion is presently as follows: flexion, 90° without contracture; abduction, 30°; adduction, 20°; internal rotation, 20°; and external rotation, 20°.

Dr. Charles Lai:

Dr. Anderson, has it not been shown that the degenerative joint disease that occurs in association with Paget's disease is characterized by certain roentgenographic findings?

Dr. Anderson:

The bony deformities associated with Paget's disease often lead to abnormalities in joint mechanics and ultimately to secondary degenerative changes. In a study by Graham and Harris,[9] they found that the hip was the most frequently affected joint. A classification of the various types of degenerative changes in the hip joint in a patient with Paget's disease has been proposed by Roper.[21] *Type I* reveals osteoarthritis with coincidental Paget's disease that is characterized by *superior* joint space narrowing with typical pagetoid changes in adjacent bones. Narrowing of the superior joint space is a constant feature of degeneration of the hip. The medial joint space is narrowed without protrusion in Type II changes. When this alteration occurs and is limited to the medial side, it is regarded as a reliable indication of Paget's disease. As the involvement progresses to the Type III stage, the medial joint narrowing increases and protrusion becomes more evident. The superior joint space narrows in addition to the Type III changes in the Type IV lesion. All of these features are considered indicative of advanced degenerative joint disease in Paget's disease.

Other roentgenographic findings of Paget's disease in the hip joint as defined by Graham and Harris[9] include a halo of osteoporosis above the acetabulum with thick, prominent trabeculae crossing it as normal stress lines; thinning of the subchondral bone plate of the acetabulum; sclerosis around the greater sciatic notch; prominent transverse trabeculae in the posterior iliac crest, and broadening of the ilio-pectineal line (brim sign).

Dr. Dehner, is there anything characteristic histologically of the osteoarthritis of Paget's disease from the idiopathic variety?

Dr. Dehner:

If I can rely upon this case and the few others which I have seen, there are very few morphologic differences.

Dr. Anderson:

Dr. Thompson, in light of technical difficulties in surgery, plus the question of loosening of the femoral prosthesis in the abnormal bone structure, what are your indications for total hip replacement in Paget's disease?

Dr. Roby Thompson:

Before I answer your question about indications for hip replacement in Paget's disease, I would like to make some general comments. I believe the changes in the hip joint that occur with Paget's disease are secondary to the bony changes that produce joint incongruities and secondary degenerative arthritis. For example, Paget's disease of the ileum may produce secondary degenerative arthritis of the hip without concomitant Paget's involvement of the femur, or vice versa. In my experience, it is unusual to have significant pain as a result of Paget's disease of a single bone. Therefore, when a patient presents complaining of pain in the region of the hip joint and an Xray indicates Paget's disease, the differential diagnosis in addition to possible arthritis of the hip joint must include neoplasia arising from the Paget's disease. Whenever this diagnosis is considered, a needle biopsy of the pelvis is indicated to rule out an underlying osteosarcoma, prior to total hip replacement.

Now to answer your original question. The indications for hip replacement in Paget's disease are relatively simple. The indications are the same as they are for any other disease of the hip joint; that is, primarily, pain. I would not exclude a patient from replacement because they have Paget's disease. The technical difficulties are demonstrated in the case you just presented. It is common to have a very sclerotic femoral shaft with obliteration of the medullary canal. Great care must be taken not to produce a fracture of the femur in the process of preparing the canal for the femoral component. Protrusion of the acetabulum is usually associated with Paget's disease of the pelvis, but adequate positioning of the prosthesis can be achieved without undue difficulty.

Dr. Anderson:

If there are no further comments, let me summarize the clinical history and findings in the second patient for discussion. The patient was a 43 year old white female when she initially presented with low back pain in February, 1971. Her symptoms remained mild and intermittent until October, 1972, when she first sought medical attention. At that time, she complained that the low back pain had progressed and there was radiation of pain into both legs, the right greater than the left.

The major physical finding was confined to the palpation of a firm, irregular mass in the left iliac fossa measuring 6 cm. in diameter. There were no other significant abnormalities.

Laboratory results included a hemogram, urinalysis, serum calcium, and phosphorus which were within normal limits. The serum alkaline phosphatase was 825 I.U. Roentgenographic examination revealed a large sclerotic mass in the left ilium and a uniform density of the L4 vertebral body (Figure 4). The chest Xray and a survey of the remainder of the skeletal system were negative.

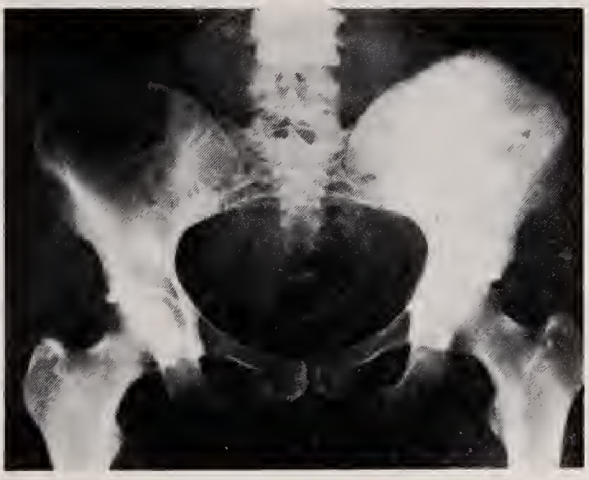

Fig. 4—Case 2. Xray of pelvis, revealing a large sclerotic mass in the (Lt) ilium and sclerosis of the vertebral body of L4.

An open biopsy of the left iliac crest showed osteosarcoma with evidence of Paget's disease. She subsequently received 6000 rads to the pelvis and lumbar vertebra over the next two months. The serum alkaline phosphatase fell to 383 I.U. during this period. Chemotherapy consisting of actinomycin D and vincristine was instituted after the completion of radiation therapy. Cyclophosphamide was added six months later, at which time the alkaline phosphatase was 92 I.U.

In July, 1974, twenty months after the diagnosis was established, the patient complained of paresthesias along the anterior aspect of the right leg. The neurologic examination was normal except for diminished patellar reflexes on the right. A lumbar myelogram revealed narrowing of the spinal canal at L4. Non-surgical management was selected, and the patient was closely followed for any evidence of progression of the neurologic symptoms or signs. Approximately nine months later, in April, 1975, she developed marked increase in lower back pain with radiation into both legs. A repeat lumbar myelogram showed a complete block at L4. An emergency decompressive laminectomy from L3-L5 was performed with nearly complete relief of symptoms.

The patient is still maintained on chemotherapy without further progression of her disease at this time. It is obvious that this patient with Paget's disease and osteosarcoma is unusual in terms of her long survival.

Dr. Dehner, would you please review the patient's biopsy from the iliac mass and the lumbar region? We would also appreciate your comments about "sarcomatous degeneration or transformation" in Paget's disease.

Dr. Dehner:
She is somewhat unusual in that the majority of patients who develop a malignant bone tumor as a complication of Paget's disease generally have a long clinical history and polyostotic involvement. The orthopedic surgeon should consider underlying Paget's disease in any adult with an osteosarcoma, especially when it originates in the skull, jaw bones, vertebral bodies, and flat bones of the pelvis. Another important clue to the possibility of "Paget's sarcoma" is the occurrence of multi-focal skeletal neoplasms as demonstrated in our patient.

The biopsy of the left iliac mass was composed of gritty tissue that, after decalcification, showed irregular islands of neoplastic osteoid and bone (Figure 5). There was a uniform proliferation of small to moderately large basophilic tumor cells filling the intertrabecular spaces (Figure 5). Many of the cells adjacent to the islands of malignant osteoid were seemingly attached to the mineralized matrix. Very few mosaic lines were noted within the immediate tumor. Mitotic figures were present in approximately 10% of the cells. Neither multinucleated nor bizarre cell types were a conspicuous part of the biopsy. Neoplastic tissue excised from the lumbar vertebral body approximately two years later was essentially identical in morphology to the iliac tumor. In areas at the periphery of the main mass in both lumbar and iliac specimens, there was evidence of typical Paget's disease.

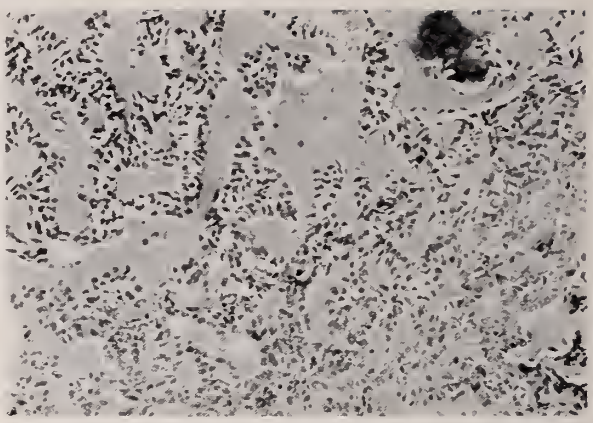

Fig. 5—The pattern of osteosarcoma in the ilium and the lumbar vertebra are similar in appearance. The islands of malignant osteoid are surrounded by anaplastic cells with focal mitosis (Hematoxylin and eosin, x 175).

It has already been mentioned that Paget himself recognized that there was a risk of sarcomatous degeneration in the disease that he described. The incidence of this complication and its clinicopathologic characterization have been reviewed by Porretta and coworkers,[18] and others.[16,19,2] Longstanding symptomatic disease and polyostotic involvement are the factors associated with the highest risk of malignant change.[27] Although the male:female ratio is nearly equal in Paget's disease, sarcomas occur more often in males by 2:1. There is no uniformly accepted figure for the incidence of sarcoma in patients with Paget's disease, but it is reasonable to consider that the risk is no greater than 1-2%, and probably even lower. In adults over 40 years of age with primary osteosarcomas or fibrosarcomas of bone, as many as 25-30% will have underlying Paget's disease.[28] The Paget's disease, as in our patient, may not be recognized until the bone neoplasm becomes symptomatic. A small percentage of patients with a sarcoma will have only one bone involved with osteitis deformans. Two of the three long-term survivors with Paget's sarcoma who were reported by Schatzki and Dudley had monostotic disease.[27] The difficulties in the diagnosis of sarcomatous transformation from the clinical and roentgenographic standpoint are well recognized.[2] Disproportionate pain, an osteolytic defect, particularly in the femur, failure of a fracture through a pagetoid area to heal, and a soft tissue mass should raise the suspicion of a sarcoma. It is also important to realize that other non-neoplastic changes occur in Paget's disease that can simulate malignancy in the roentgenographic examination.[1,4,12]

Osteosarcoma accounts for 50% or more of the tumors in Paget's disease; fibrosarcoma representing another 20-25%.[18,19] Chondrosarcomas, giant cell tumors, and highly anaplastic sarcomas that are not further classifiable constitute the remaining tumor types.[11] The femur, humerus, pelvis, and skull-facial bones are the anatomic locations for 80% of all tumors. It is worthwhile to point out that when a true giant cell tumor occurs in the mandible or maxilla, Paget's disease should be considered as an associated disorder.[17] The prognosis for a sarcoma in Paget's disease is extremely dismal, with survival figures of only 1-3%.[16,19] Our patient unquestionably presents an unusual type of clinical course for Paget's sarcoma. Most individuals are dead of tumor within one to two years. However, high dosage irradiation and chemotherapy have obviously had their effect in this patient.

Dr. Anderson:

Dr. Dehner, are you implying that the osteosarcomas of the vertebral body and the ilium are independent neoplasms or is one a metastases from the other?

Dr. Dehner:

That question is impossible to answer. As I have already indicated in the description of the histology, the appearance from the two locations was virtually identical. I would like to think of the neoplasms as independent primaries occurring in polyostotic Paget's disease.

Dr. Thompson:

Dr. Anderson, could you comment on the use of chemotherapy in the treatment of osteosarcoma in Paget's disease?

Dr. Anderson:

To my knowledge, there is little, if any published data to establish a superior drug regimen. Multiple drug therapy with Vincristine, high dose methotrexate-citrovorum factor "rescue," cyclophosphamide, and adriamycin, has proven effective in halting the progression of metastatic osteogenic sarcoma in children.[22] This treatment method might prove reasonable in adults with Paget's sarcoma.

I would like to ask Dr. David Brown about some of the current trends in the non-surgical management of the disease. The role of calcitonin is probably the topic receiving the most attention in the recent literature.

Dr. David Brown:

Treatment of Paget's disease has been based upon attempts to decrease the markedly increased bone resorption rate. Hence, calcitonin therapy[3,7,10] has been associated with successful reduction of symptoms of skeletal and radicular pain and overt neurologic deficits. Although some patients have intermittent clinical exacerbations during the second and third year of therapy, the majority maintain symptomatic as well as roentgenographic improvement. Most patients show reductions in urinary hydroxyproline excretion as well as serum alkaline phosphatase levels although neither of these parameters truly returns to normal. The reasons for the plateau of effectiveness are uncertain.[20] It is unlikely that antibodies to calcitonin are the cause of the plateau, although secondary increases of parathyroid hormone secretion as well as ongoing osteolytic bone resorption may contribute to this phenomenon.[10] The continual elevations of urinary hydroxyproline excretion as well as serum alkaline phosphatase may be due to enhanced bone formation.[3] The dose of salmon calcitonin, which is the most commonly used form, is 50 MRC units three times a week. Approximately 20% of patients experience mild nausea and vomiting which does not necessitate discontinuation of therapy. It is possible that addition of Vitamin D and calcium supplementation may reduce secondary hyperparathyroidism.

Diphosphonate, a synthetic analogue of pyrophosphate, has been found to be effective in reducing bone turnover in Paget's disease, and has been associated with increased accumulation of osteoid, the clinical significance of which is uncertain.[23-25] Mitramycin, a cytotoxic antibiotic which has been used to treat patients with bone resorption and hypercalcemia due to metastatic lesions of bone, has been used in Paget's disease.[8,26] Biochemical and clinical improvement has been found in most patients. The effective dose has been 15-25 micrograms/kilogram/day. However, this drug may have significant hematologic and renal toxicity, although these complications have not been found to be significant at the dosage of Mitramycin recommended in this disorder.[26]

Dr. Anderson:

Which of these drugs would you recommend at this time for the medical treatment of Paget's disease and what are your indications for their use?

Dr. Brown:

I would recommend calcitonin as therapy for Paget's disease. The indications for its use would be generalized symptomatology, including severe bone pain, neurological deficit, or congestive heart failure.

Dr. Dehner:

Is there any objective clinical evidence of improvement besides the biochemical evidence of decreasing urinary hydroxyproline and alkaline phosphatase values?

Dr. Brown:

There is bone biopsy evidence of decreased bone resorption.[3]

References

1. Anderson JT and Dehner LP: Osteolytic form of Paget's disease. Differential diagnosis and pathogenesis. J Bone Joint Surg (Am) 58:994, 1976.
2. Barry HC: Paget's disease of bone. Edinburgh and London, E & S Livingstone Ltd. pp 136-177, 1969.
3. Bordier P, Rasmussen H and Dorfmann H: Effectiveness of parathyroid hormone, calcitonin and phosphate on bone cells in Paget's disease. Am J Med 56:850, 1974.
4. Bowerman JW, Altman J, Hughes JL and Zadek RE: Pseudo-malignant lesions in Paget's disease of bone. Am J Roentgenol Radium Ther Nucl Med 124:57, 1975.
5. Collins DH: Paget's disease of bone. Incidence and subclinical forms. Lancet 2:51, 1956.
6. Collins DH: Pathology of bone, London, Butterworths and Co., pp 228-248, 1966.
7. DeRose J, Singer FR, Avramides A, Flores A, Dziadiw R, Baker R and Wallach S: Response of Paget's disease to porcine and salmon calcitonins. Am J Med 56:858, 1974.
8. Elias EG and Evans JT: Mitramycin in the treatment of Paget's disease of bone. J Bone Joint Surg (Am) 54:1730, 1972.
9. Graham J and Harris WH: Paget's disease involving the hip joint. J Bone Joint Surg. (Br) 53:650, 1971.
10. Greenberg PB, Doyle FH, Fisher MT, Hillyard CJ, Joplin GF, Pennock J and MacIntyre I: Treatment of Paget's disease of bone with synthetic human calcitonin. Biochemical and roentgenologic changes. Am J Med 56:867, 1974.
11. Hutter RVP, Foot FW Jr, Frazell EL and Francis KC: Giant cell tumors complicating Paget's disease of bone. Cancer 16:1044, 1963.
12. Jacobs P: Osteolytic Paget's disease. Clin Radiol 25:137, 1974.
13. Jaffe HL: Paget's disease of bone. Arch Pathol 15:83, 1933.
14. Jaffe HL: Metabolic, degenerative and inflammatory diseases of bones and joints. Philadelphia, Lea and Febiger, pp 240-271, 1972.
15. Khairi MRA, Wellman HW, Robb JA and Johnston CC Jr: Paget's disease of bone (osteitis deformans): symptomatic lesions and bone scan. Ann Intern Med 79:348, 1973.
16. McKenna RJ, Schwinn CP, Soong KY and Higinbotham NL: Osteogenic sarcoma arising in Paget's disease. Cancer 17:42, 1964.
17. Miller AS, Cuttino CL, Elzay RP, Levy WM and Harwick RD: Giant cell tumor of the jaws associated with Paget's disease of bone. Report of two cases and review of the literature. Arch Otolaryngol 100:233, 1974.
18. Porretta CA, Dahlin DC and Janes JM: Sarcoma in Paget's disease of bone. J Bone Joint Surg (Am) 39:1314, 1957.
19. Price CHG and Goldie W: Paget's sarcoma of bone. A study of eighty cases from the Bristol and Leeds Bone Tumor Registries. J Bone Joint Surg (Br) 51:205, 1969.
20. Rojanasathit S, Rosenberg E and Hadded JG Jr: Paget's disease: response to human calcitonin in patients resistant to salmon calcitonin. Lancet 2:1412, 1974.
21. Roper BA: Paget's disease involving the hip joint. Clin Orthop 80:33, 1971.
22. Rosen G, Tan C, Sanmaneechai A, Beattie EJ Jr, Marcove R and Murphy ML: The rationale for multiple drug chemotherapy in the treatment of osteogenic sarcoma. Cancer 35:936, 1975.
23. Russell RG and Smith R: Diphosphonates—A review of their effect on calcium metabolism and their potential clinical application. J Bone Joint Surg (Br) 54:172, 1972.
24. Russell RG and Smith R: Diphosphonates—Experimental and clinical aspects. J Bone Joint Surg. (Br) 55:66, 1973.
25. Russell RG, Smith R, Preston C, Walton RJ and Woods CG: Diphosphonates in Paget's disease. Lancet1:894, 1974.
26. Ryan WG, Leggin D, Northrop G and Schwartz TB: Treatment of Paget's disease of bone with mithramycin. Excerpta Medica, Amsterdam, p 535, 1973.
27. Schatzki SC and Dudley HR: Bone sarcoma complicating Paget's disease. A report of 3 cases with long survival. Cancer 14:517, 1961.
28. Sissons HA: Epidemiology of Paget's disease. Clin Orthop 45:73, 1965.
29. Woodhouse NJY: Paget's disease of bone. Clin Endocrinol Metab 1:125, 1972.

Electrotheraphy and Renal Transplantation—Impediment to Treatment

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References

1. Frieberg J: Electroshock therapy: let's stop blasting the brain, psychology today 9:18 August, 1975.
2. Kesey K: One Flew Over the Cockoos Nest. New American Library, Inc., New York, 1962.
3. The Playboy Forum, Playboy Magazine, p 57-58, January, 1970.
4. Price vs. Sheppard 239 NW 2nd 905, Northwestern Reporter Series.
5. Arndt RE: Observations on the effects of electric convulsive treatments in man. Psychological. Dis Nerv System 36:409 September, 1975.
6. Ardren HE: Treatment or mistreatment in psychiatry, Diseases of the Nervous System 37:605 November, 1976.
7. Freedman AM & Kaplan HI: Comprehensive Textbook of Psychiatry. The Williams and Williams Company p 1283, 1967.
8. Talkington PC: Electroshock therapy: its uses and effects. U.S. News & World Report, p 17, August 7, 1972.
9. Treffert DA: The practical limits of patients' rights. Psychiatric Annals 5:91 April, 1975.
10. Blazer DG, Petrie WH & Wilson WP: The treatment of psychiatric complications of renal transplant. From the Dept. of Psych., Duke Med. Center, Durham, NC. Grant AM-13084-10. Affective psychoses following renal transplant. Dis Nerv Sys 37:663 December, 1976.
11. Stone AA: Overview: the right to treatment—comments on the law and its impact. Amer J Psych 132:11 November, 1975.

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REVIEW OF MEDICAL MICROBIOLOGY, Ed. 12, E. Jawetz, J. L. Melnick, E. A. Adelberg, 542 pp. Lange Medical Publication, 1976.

The biannual edition of this book is an excellent review of medical microbiology. The general references are current and appropriate. Readers can be assured of receiving present concepts as well as factual information in an ever-changing field. At the same time, basic and practical information that has not changed is preserved in the text. While the microbiologist, the clinical pathologist familiar with diagnostic microbiology, or the infectious disease physician, will question selected statements or the relative emphasis on certain subjects, the overall contents provides ready access to both the basic and applied medical microbiology.

The major emphasis is on virology, bacteriology, basic concepts of microbiology and immunology with less emphasis on mycology, rickettsiae, chlamydiae and parasitology. The student, at any level of education, interested in medical microbiology should find this text a worthwhile addition to his or her library.

On the other hand, I do not think the average clinician, unless specifically interested in microbiology would find this of practical value in spite of its appealing cost. Chapter 10, Antimicrobial Chemotherapy, is not sufficiently detailed to be of practical value to the clinician treating a specific infectious disease. Regardless, the student, the clinician or the laboratory microbiologist who reads this text would be well-served by becoming very familiar with and understanding Chapter 26, Principles of Diagnostic Microbiology. This along with Chapter 28, Isolation of Viruses from Clinical Specimens, is the real meeting ground of all the disciplines interested in medical microbiology. The need for this understanding is particularly true in this era of many different antimicrobial agents and the increased prevalence of disease due to one's own flora on one hand versus infection or colonization without disease on the other.

R. P. Gruninger, M.D.
Worcester, Massachusetts

REVIEW OF MEDICAL PHARMACOLOGY, 5th edition. Paperback. F. H. Meyers, E. Jewetz, A. Goldfien. 740 pages. Paper cover. 1976. Lange Medical Publications. Los Altos, California. Price $12.50.

This popular textbook of pharmacology, first published in 1968, is now in its 5th edition. Chapter bibliographies with 1975 and 1976 references attest to the revision that has occurred throughout this book. In addition to the authors, including a pharmacologist, a microbiologist, and an internist, many authors contributed chapters. It would be helpful for readers outside of California to have a brief sketch of the other authors. The three major authors are all from San Francisco and no doubt are well known there. This is obviously an excellent text. One can criticize small points such as in the chapter on Fluids & Electrolytes. The water excess discussion includes headache, nausea, vomiting, etc., but fails to mention the chief problem of water excess, that is pulmonary congestion and heart failure.

A text such as this rightly appears in paperback. The fact that the authors have issued new editions every two years is indicative perhaps of the period of obsolescence of a review of this type.

Reuben Berman, M.D.
Editor Emeritus

CURRENT MEDICAL DIAGNOSIS AND TREATMENT (Krupp & Chatton), Lange Medical Publications, Los Altos, Calif., 1975. Price $13.50, 1044 pages.

This excellent Synopsis of Medicine has had a new edition every year since 1962. It is now available in eight languages, even in Serbo-Croation. Most contributors are based either at Stanford University or at the University of California, San Francisco.

The field of medicine is covered well and succinctly, and the subject index is complete. This book is not intended to be a medical text, but a valuable Vademecum. It includes traditional knowledge and also new chapters on medical genetics, cancer chemotherapy, and immunological disorders. Even the Problem-Oriented—Chart of Weed was allotted a corner in the appendix with an adequate reference section for the interested.

This volume, like its preceding editions, should be well received by medical students, fledgling physicians, and practitioners alike. It comes in soft cover, on good paper, and with adequate print and layout. The price is reasonable.

H. W. Heupel, M.D.
Minneapolis, Minnesota

REVIEW OF MEDICAL PHYSIOLOGY (6th Edition), William F. Ganong, M.D., Lange Medical Publications, Los Altos, California. 1973, Paperback.

This Review of Medical Physiology is adequate for the physician who is in practice. It provides a tremendous amount of information on the physiology of all the medical systems.

References for each section are adequate, though not comprehensive. The index seemed to be well prepared.

In the doctor's office the book could be used as a reference or for a bit of deviation from his routine of clinical practice. No matter what his specialty, he would find it interesting to read up on some of the physiological reactions that are constantly going on within the human body.

Carl O. Rice, M.D.
Editor-Emeritus

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References:
1 Dornfeld L, Kane R. Metolazone in essential hypertension The long-term clinical efficacy of a new diuretic *Curr Ther Res* **18:** 527-533, 1975
2 Data on file, Medical Department, Pennwalt Prescription Products

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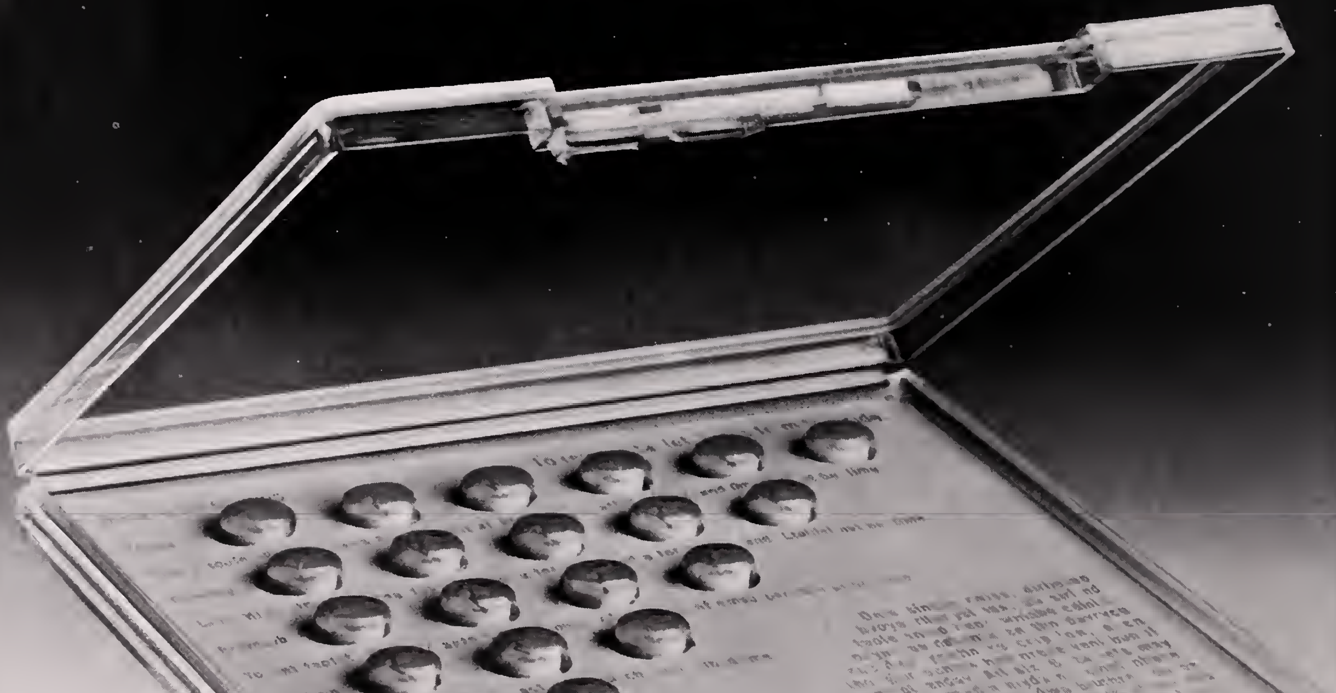

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Pulmonary Function in Healthy Minnesota Children

Spirometry Studies

WARREN J. WARWICK, M.D.*

THE DIAGNOSIS, ASSESSMENT and follow-up of pediatric lung disease requires spirometric pulmonary function tests. This study was undertaken to obtain normal values of simple spirometric pulmonary function tests for Minnesota children. The study was undertaken after consultation with Dr. George Polgar, author of the book *Pediatric Pulmonary Testing in Children,*[1] who advised that all present pediatric pulmonary function standards needed improvement. In view of the diverse factors which influence pulmonary functions in childhood, including race, national origin, exposure to air pollution, acute as well as chronic illnesses, smoking and so forth, the present study was designed to reduce these variables by selecting healthy white children, from a large middle class city with a lowel level of air pollution.

Experimental Plans

Participants

The study was a joint project of the Division of Pediatric Pulmonary Disease, University of Minnesota Medical School, Hennepin County Lung Association and the Bloomington school system.

Children Chosen for the Study

Children were chosen for the study from those who volunteered and whose parents agreed after being informed of the nature of the project. All children with an acute illness within the past month or with a history of any chronic illness were excluded. Twenty male and twenty female participants were selected at random from each one-inch height interval. Their heights were remeasured on the day of the pulmonary function testing to the nearest 0.1 cm using a special technique.[2]

Background Information

The following measurements were obtained on each of the subjects: sex, date of birth, date of test, height measured at the time of testing to the nearest tenth centimeter, weight measured to the nearest pound, depth of chest,[3] width of chest,[3] and anterior thigh skin fold thickness and circumference.[2] The following history was obtained: census tract of home, family size, education of parents, dietary history, smoking history, and exercise capacity as estimated by the time required to run 330 or 660 yards. All of this information was recorded on a separate envelope for each child.

Equipment

The Med-Science Wedge Spirometer with Pulmo-Digitizer was used for all tests. Volume calibration was done each morning using a standard one liter syringe. This device automatically computed the peak expiratory flow rate, the forced expiratory volume in 0.75 seconds, the forced expiratory volume in one second and the vital capacity. Recordings were obtained on the flow *versus* time and volume versus time on a Technirite recorder. Forced expiratory flow volume curves were obtained with a Hewlett-Packard Model No. 7045-A XY recorder.

Pulmonary Function Testing

All pulmonary function tests were done on the morning of a school day between 9:00 a.m. and 12:00 noon. The children were instructed in small groups by the pulmonary function technician who performed all the tests. After instruction, each child had a practice trial before attempting three to five maximum forced expiratory maneuvers. All children appeared to understand and to give maximum efforts in the testing. The data from the digitizer, the room temperature and the barometric pressure, and the time of testing were recorded on an envelope and all tracings

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*Associate Professor, Department of Pediatrics, University of Minnesota Medical School, Minneapolis, Minnesota.

The research presented in this paper is made possible by a grant from the Minnesota Lung Association, a Cystic Fibrosis Care, Research and Teaching Center grant from the United States Cystic Fibrosis Foundation, by direct assistance from the Hennepin County Lung Association, the Hewlett Packard Corporation and Medical Science, Inc.

from that study were placed in that envelope.

All tests from each patient were examined and the best maneuver was selected for measurement of the several variables.

The values were tabulated, key-punched and analyzed on the University of Minnesota CDC 3300 computer. The regression equations for all tests were calculated on a linear and logarithmic basis. Since, in all instances, the logarithmic regression equations were as good as or better than the linear regression equations. The logarithmic equations were used in preparing our tables of normal values. The logarithmic regression equation formulae are recorded in Table 1.

Observations

In Table 2 for females and Table 3 for males are recorded the normal values for Minnesota children for six of the single functions measured and four of the double functions.

Three of these, peak flow, vital capacity and the forced expiratory time are obvious points worthy of study, three others, the FEV .75, the FEF .75 and the FEV 1, are arbitrary measurements which have been demonstrated to have clinical usefulness.

Peak Flow (PF)

The PF in liters per second presents the maximum obtainable velocity in which air can flow from the lungs in a forced expiratory maneuver. It is a useful measure of large airway obstruction and is such that it is frequently decreased in patients with asthma, cystic fibrosis and any narrowing of the trachea.

Forced Expiratory Volume in 0.75 Seconds (FEV .75)

The FEV .75 is the volume of air expired in the first three-quarters second. This approaches the vital capacity in the small children and becomes a decreasing fraction of the vital capacity in the older and larger child. It is a complex function whose value is determined in part by obstructive changes in all of the airways. The

TABLE 1

Pulmonary Function Test	Sex	Regression Equation Against Height (H) in centimeters as the Independent Variable	Standard Deviation of Test on Height (Percent)	Rho
PF	M	$\ln PF = 2.4991 \ln H - 10.7785$	16	.93
	F	$\ln PF = 2.4369 \ln H - 10.5350$	15	.91
FEV.75	M	$\ln FEV.75 = 2.6616 \ln H - 12.5299$	12	.96
	F	$\ln FEV.75 = 2.6630 \ln H - 12.5835$	11	.95
FEF.75	M	$\ln FEF.75 = 2.6693 \ln H - 12.2815$	12	.96
	F	$\ln FEF.75 = 2.6671 \ln H - 12.3188$	11	.95
FEV_1	M	$\ln FEV_1 - 2.7572 \ln H - 12.9007$	12	.97
	F	$\ln FEV_1 = 2.7522 \ln H - 12.9210$	11	.96
VC	M	$\ln VC = 3.0131 \ln H - 14.0535$	12	.97
	F	$\ln VC = 2.9446 \ln H - 13.8007$	12	.96
FET	M	$\ln FET = 1.6208 \ln H - 7.2327$	49	.39
	F	$\ln FET = 1.2423 \ln H - 5.3288$	44	.45
$\frac{FEV.75}{VC}$	M	$\ln \frac{FEV.75}{VC} = -0.3621 \ln H + 1.5775$	8	−.57
	F	$\ln \frac{FEV.75}{VC} = -0.3141 \ln H + 1.3802$	8	−.44
$\frac{FEV_1}{VC}$	M	$\ln \frac{FEV_1}{VC} = -.2679 \ln H + 1.2137$	7	−.53
	F	$\ln \frac{FEV_1}{VC} = -0.2126 \ln H + 0.9719$	6	−.40
$\frac{VC}{FET}$	M	$\ln VC/FET = 1.7571 \ln H - 8.6596$	48	.51
	F	$\ln VC/FET = 1.3193 \ln H - 6.5455$	45	.38
$\frac{PF}{VC}$	M	$\ln PF/VC = -0.5135 \ln H + 3.2727$	15	−.49
	F	$\ln PF/VC = -0.5078 \ln H + 3.2657$	16	−.40

TABLE 2

Pulmonary Function Normal Values for Minnesota Children
(Females 90-178 cm.)

Height (cm.) (Ht.) cm	Peak Flow (PF) liters/sec.	Forced Expiratory Volume .75 sec. (FEV) .75) liters	Forced Expiratory Flow .75 sec. (FEF .75) liters/sec.	Forced Expiratory Volume 1 sec. (FEV1) liters	Vital Capacity (VC) liters	Forced Expiratory Time (FET) seconds	Forced Expiratory Volume .75 Vital Capacity (FEV .75/VC)	Forced Expiratory Volume 1.0 Vital Capacity (FEV1/VC)	Vital Capacity Forced Expiratory Time (VC/FET) liter/second	Peak Flow Vital Capacity (PF/VC) $second^{-1}$
90	1.54	.55	.73	.58	.58	1.06	.97	1.00	.55	2.67
92	1.62	.58	.78	.62	.62	1.10	.96	1.00	.56	2.64
94	1.71	.62	.82	.65	.66	1.14	.95	1.00	.58	2.62
96	1.80	.65	.87	.69	.70	1.18	.95	1.00	.59	2.59
98	1.89	.69	.92	.73	.74	1.22	.94	1.00	.61	2.55
100	1.99	.73	.97	.77	.79	1.26	.94	.99	.63	2.53
102	2.09	.77	1.02	.82	.83	1.30	.93	.99	.64	2.50
104	2.19	.81	1.08	.86	.88	1.34	.92	.98	.66	2.48
106	2.29	.85	1.13	.91	.93	1.39	.92	.98	.67	2.45
108	2.40	.89	1.19	.96	.99	1.43	.91	.98	.69	2.43
110	2.51	.94	1.25	1.01	1.04	1.47	.91	.97	.71	2.41
112	2.62	.98	1.31	1.06	1.10	1.51	.90	.97	.73	2.39
114	2.74	1.03	1.37	1.11	1.16	1.56	.90	.97	.74	2.37
116	2.85	1.08	1.44	1.16	1.22	1.60	.89	.96	.76	2.34
118	2.98	1.13	1.50	1.22	1.28	1.65	.89	.96	.78	2.32
120	3.10	1.18	1.57	1.28	1.35	1.69	.88	.95	.80	2.30
122	3.23	1.23	1.64	1.34	1.41	1.74	.88	.95	.81	2.29
124	3.36	1.29	1.72	1.40	1.48	1.79	.87	.95	.83	2.27
126	3.49	1.34	1.79	1.46	1.55	1.83	.87	.95	.85	2.25
128	3.63	1.40	1.87	1.53	1.63	1.88	.87	.94	.87	2.23
130	3.77	1.46	1.95	1.59	1.70	1.93	.86	.94	.88	2.21
132	3.91	1.52	2.03	1.66	1.78	1.98	.86	.94	.90	2.20
134	4.06	1.58	2.11	1.73	1.86	2.03	.85	.93	.92	2.18
136	4.21	1.65	2.20	1.80	1.95	2.07	.85	.93	.94	2.16
138	4.36	1.71	2.28	1.88	2.03	2.12	.85	.93	.96	2.15
140	4.51	1.78	2.37	1.95	2.12	2.17	.84	.92	.98	2.13
142	4.61	1.85	2.46	2.03	2.21	2.23	.84	.92	.99	2.12
144	4.84	1.92	2.56	2.11	2.30	2.28	.83	.92	1.01	2.10
146	5.00	1.99	2.65	2.19	2.40	2.33	.83	.92	1.03	2.09
148	5.17	2.06	2.75	2.28	2.50	2.38	.83	.91	1.05	2.07
150	5.34	2.14	2.85	2.36	2.60	2.43	.82	.91	1.07	2.06
152	5.52	2.21	2.95	2.45	2.70	2.48	.82	.91	1.09	2.04
154	5.69	2.29	3.06	2.54	2.80	2.54	.82	.91	1.10	2.03
156	5.88	2.37	3.16	2.63	2.91	2.59	.81	.90	1.12	2.02
158	6.06	2.46	3.27	2.73	3.02	2.65	.81	.90	1.14	2.00
160	6.25	2.54	3.39	2.82	3.14	2.70	.81	.90	1.16	1.99
162	6.44	2.62	3.50	2.92	3.26	2.75	.80	.90	1.19	1.98
164	6.64	2.71	3.62	3.02	3.38	2.81	.80	.89	1.20	1.97
166	6.84	2.80	3.73	3.12	3.50	2.87	.80	.89	1.22	1.95
168	7.04	2.89	3.86	3.23	3.62	2.92	.80	.89	1.24	1.94
170	7.25	2.98	3.98	3.34	3.75	2.98	.79	.89	1.26	1.93
172	7.45	3.08	4.10	3.44	3.88	3.04	.79	.88	1.28	1.92
174	7.67	3.17	4.23	3.56	4.02	3.09	.79	.88	1.30	1.91
176	7.88	3.27	4.36	3.67	4.16	3.15	.78	.88	1.32	1.90
178	8.10	3.37	4.50	3.79	4.30	3.21	.78	.88	1.34	1.89

TABLE 3

Pulmonary Function Normal Values for Minnesota Children
(Males 90-188 cm.)

Height (cm.) (Ht.) cm	Peak Flow (PF) liters/sec.	Forced Expiratory Volume .75 sec. (FEV) .75) liters	Forced Expiratory Flow .75 sec. (FEF .75) liters/sec.	Forced Expiratory Volume 1 sec. (FEVI) liters	Vital Capacity (VC) liters	Forced Expiratory Time (FET) seconds	Forced Expiratory Volume .75 Vital Capacity (FEV .75/VC)	Forced Expiratory Volume 1.0 Vital Capacity (FEV1/VC)	Vital Capacity Forced Expiratory Time (VC/FET) liter/second	Peak Flow Vital Capacity (PF/VC) second^{-1}
90	1.60	.58	.77	.61	.61	1.30	.95	1.00	.47	2.62
92	1.69	.61	.81	.65	.65	1.33	.94	1.00	.49	2.59
94	1.78	.65	.86	.69	.69	1.37	.93	1.00	.50	2.56
96	1.87	.68	.91	.73	.74	1.41	.93	.99	.52	2.53
98	1.97	.72	.96	.77	.79	1.44	.92	.99	.55	2.51
100	2.08	.76	1.01	.82	.84	1.48	.91	.98	.57	2.48
102	2.18	.80	1.07	.86	.89	1.52	.91	.97	.59	2.45
104	2.29	.84	1.13	.91	.94	1.55	.90	.97	.61	2.43
106	2.40	.89	1.19	.96	1.00	1.59	.89	.96	.63	2.41
108	2.52	.93	1.25	1.01	1.06	1.63	.89	.96	.65	2.38
110	2.63	.98	1.31	1.06	1.12	1.67	.88	.96	.67	2.36
112	2.76	1.03	1.37	1.12	1.18	1.70	.88	.95	.69	2.34
114	2.88	1.08	1.44	1.17	1.24	1.74	.87	.95	.71	2.32
116	3.01	1.13	1.51	1.23	1.31	1.78	.87	.94	.74	2.28
118	3.14	1.18	1.58	1.29	1.38	1.82	.86	.94	.76	2.28
120	3.27	1.24	1.65	1.35	1.45	1.86	.85	.93	.78	2.26
122	3.41	1.29	1.72	1.41	1.52	1.89	.85	.93	.80	2.24
124	3.55	1.35	1.80	1.48	1.60	1.93	.85	.93	.83	2.22
126	3.78	1.41	1.88	1.54	1.68	1.97	.84	.92	.85	2.20
128	3.85	1.47	1.96	1.61	1.76	2.01	.84	.92	.88	2.18
130	4.00	1.53	2.04	1.68	1.85	2.05	.83	.91	.90	2.17
132	4.15	1.59	2.13	1.75	1.93	2.09	.83	.91	.92	2.15
134	4.31	1.66	2.21	1.83	2.02	2.13	.82	.91	.95	2.13
136	4.48	1.73	2.30	1.90	2.11	2.17	.82	.90	.97	2.12
138	4.64	1.79	2.39	1.98	2.21	2.21	.81	.90	1.00	2.10
140	4.81	1.86	2.49	2.06	2.31	2.25	.81	.90	1.03	2.09
142	4.99	1.94	2.58	2.15	2.41	2.29	.80	.89	1.05	2.07
144	5.16	2.01	2.68	2.23	2.51	2.33	.80	.89	1.08	2.06
146	5.34	2.08	2.78	2.32	2.62	2.37	.80	.89	1.11	2.04
148	5.53	2.16	2.88	2.40	2.73	2.41	.79	.88	1.13	2.03
150	5.72	2.24	2.99	2.50	2.84	2.45	.79	.88	1.16	2.01
152	5.91	2.32	3.09	2.59	2.96	2.49	.79	.88	1.19	2.00
154	6.11	2.40	3.20	2.68	3.07	2.53	.78	.87	1.21	1.99
156	6.31	2.49	3.31	2.78	3.20	2.57	.78	.87	1.25	1.97
158	6.51	2.57	3.43	2.88	3.32	2.61	.77	.87	1.27	1.95
160	6.72	2.66	3.55	2.98	3.45	2.65	.77	.86	1.30	1.95
162	6.93	2.75	3.67	3.08	3.58	2.69	.77	.86	1.33	1.94
164	7.15	2.84	3.79	3.19	3.72	2.74	.76	.86	1.36	1.92
166	7.37	2.93	3.91	3.30	3.85	2.78	.76	.86	1.38	1.91
168	7.59	3.03	4.04	3.41	4.00	2.82	.76	.85	1.42	1.90
170	7.82	3.13	4.17	3.52	4.14	2.86	.75	.85	1.45	1.89
172	8.05	3.22	4.30	3.64	4.29	2.90	.75	.85	1.48	1.88
174	8.29	3.32	4.43	3.76	4.44	2.95	.75	.84	1.51	1.87
176	8.53	3.43	4.57	3.88	4.60	2.99	.74	.84	1.54	1.85
178	8.77	3.53	4.71	4.00	4.76	3.03	.74	.84	1.57	1.84
180	9.02	3.64	4.85	4.12	4.92	3.07	.74	.84	1.60	1.83
182	9.27	3.75	5.00	4.25	5.09	3.11	.74	.83	1.64	1.82
184	9.53	3.86	5.14	4.38	5.26	3.16	.73	.83	1.66	1.81
186	9.79	3.97	5.29	4.52	5.43	3.20	.73	.83	1.70	1.80
188	10.05	4.09	5.45	4.65	5.61	3.24	.73	.83	1.73	1.79

information content of the FEV .75 is the same as that of the FEF .75 and very similar to that of the FEV 1.0 second.

Forced Expiratory Flow .75 Seconds (FEF .75)

The FEF .75 in liters per second is numerically the FEV .75 divided by .75 seconds. Since the FEV .75 has the dimensions of a flow rate, i.e. given time some physicians find this form of expression of the measurement instinctively easier to understand.

Forced Expiratory Volume 1.0 Second (FEV 1) (FEF 1)

Some small children are able to completely empty their lungs in less than one second so the FEV 1 values are based on measurements from about 10% fewer patients then the other tests. The FEV 1.0 is identical to the FEF 1.0 except for the designation, liters *versus* liters per second. This measurement is a complex function of obstructive changes in airways of all sizes and is closely related to the FEV .75 and the FEF .75. Decreased values are not interpretable as due to the narrowing or closure of any specific size of airway.

The Vital Capacity (VC)

The VC, in this case the forced vital capacity, is the amount of air which can be rapidly forced from the lungs. It is predominantly influenced by restrictive changes in the chest and secondarily by obstructive changes in the small airways which by increasing the functional residual capacity of the lungs decrease the volume which can be expired . The VC is specifically decreased in such problems as pneumothorax, pneumonia, chest injuries, bronchiolitis, and cystic fibrosis, but it is not specifically affected by obstructive changes which do not increase the functional residual capacity of the lungs.

The Forced Expiratory Time (FET)

The FET is the total time required for a forced expiratory maneuver. The FET shows a definite skewed pattern with a tailing towards a long forced expiratory time. Although the average time is greater than one second for children of all heights about 10% of the children at the smallest heights have forced expiratory times less than one second. The forced expiratory time is essentially unaffected by obstructive changes in the major airways but is extremely affected by obstructive changes in the smaller airways. It represents the most sensitive index of small airway disease which can be obtained from a spirometric recording of a forced vital capacity. However, it is also sensitive to the effort of the subject. The high standard deviation (44 to 49 percent) may reflect this effort dependence or the existence of hidden small airway disease in these apparently healthy children.

FEV .75/VC and FEV 1/VC

Both of these are estimates of the ratio of the amount of air that can be forced from the lungs in a short time compared to the vital capacity. They may be multiplied by 100 to be expressed as a percentage of the vital capacity forced out in 0.75 or 1.0 seconds. This ratio is sensitive to obstructive changes in all airways and is of prediction value in the course of chronic bronchial disorders.

VC/FET

This ratio estimates the average flow rate of air from the lungs during a forced vital capacity maneuver. Since the bulk of the time required is due to the emptying of the lungs via the small airways this is also a sensitive test of small airway obstruction. The standard deviation of this test (45 to 48 percent) is quite great thus decreasing its sensitivity and specificity. These concerns have been discussed under FET above.

PV/VC

This ratio is the reciprocal of the time that would be required to expire one VC at the PF rate. The ratio is useful in evaluation of the relative contribution of obstructive *versus* restrictive changes in mild lung disease.

Discussion

These pulmonary function standards have been calculated on a larger group of normal healthy children than any previously reported. Although the results are similar to those published by Polgar in his comprehensive book, two points should be made in comparing these data and those published by Polgar.

First, for most of the tests the changes with heights are almost identical for boys and girls. For the PF FEV .75, FEF .75, FEV 1 and VC little information would be lost if one formula were used for both sexes.

Even for the tests with the greatest differences between the regression line formula the differences at the extremes of height are less than one standard deviation of either variable. Thus, the sex differences for these pulmonary functions are of little significance during childhood.

Second, increasing the number of subjects has not changed the standard deviation of the measurements when regression equations are based on height alone. Thus, we must accept a substantial variability for the sake of the simple formulas. The alternative of multiple variable formula would be acceptable for complete analysis but would be too complex for the preparation of simple tables for clinical use.

The data provided by this study should be useful to all physicians interested in pediatric pulmonary disease especially to practitioners in Minnesota and nearby states which have a comparable climate, Caucasian population and minimal air pollution.

References

1. Polgar G and Promadhat V: Pulmonary function testing in children, techniques and standards. W. B. Saunders, Philadelphia, Penn., 1971.
2. Weiner JS and Lourie JA: Human biology, a guide to field methods. International Biological Programme, F. A. Davis Company, 1969.
3. Warwick WJ and Hansen L: Chest calipers for measurement of the thoracic index. Clin Pediat 15:735, 1976.

Continuing Medical Education

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Vascular Surgery, June 13-15, 1977

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This course is sponsored by the Department of Pediatrics and the University of Minnesota Duluth. To be held at Mayo Memorial Auditorium, University of Minnesota, Minneapolis.

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Educational programs have been accredited by the Council on Medical Education of the American Medical Association and are acceptable for credit toward the American Medical Association Physician's Recognition Award as well as the new Minnesota State Medical Association's requirements. Approval has also been requested for Prescribed hours from the Minnesota Academy of Family Practice.

Contact the Office of Continuing Medical Education, University of Minnesota Medical School, Box 293 Mayo Memorial Building, Minneapolis, Minnesota 55455; Telephone: 612/373-8012

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(Continued from page 441)

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The committee for the Diehl Award given annually by the Minnesota Medical Alumni Association solicits nominations for this award from the physicians of Minnesota. The award is presented to one or more physicians meeting these four major criteria:

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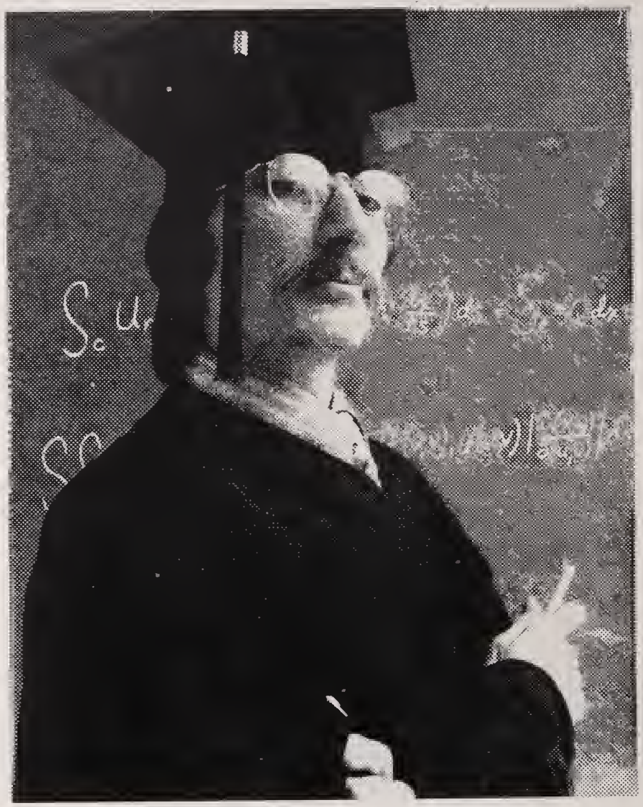

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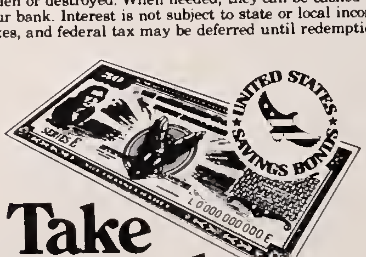

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Brief Summary

E.E.S. 400 FILMTAB®

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Indications:

Streptococcus pyogenes (Group A beta hemolytic streptococcus)—Upper and lower respiratory tract infections, skin, and soft tissue infections of mild to moderate severity, where oral medication is preferred. Therapy should be continued for 10 days.

Alpha-hemolytic streptococci (viridans group)—Short-term prophylaxis of bacterial endocarditis prior to dental or other operative procedures in patients with a history of rheumatic fever or congenital heart disease who are hypersensitive to penicillin.

S. aureus—Acute infections of skin and soft tissue of mild to moderate severity. Resistant organisms may emerge during treatment.

S. pneumoniae (D. pneumoniae)—Upper and lower respiratory tract infections of mild to moderate degree.

M. pneumoniae — For respiratory infections due to this organism.

Hemophilus influenzae: For upper respiratory tract infections of mild to moderate severity when used concomitantly with adequate doses of sulfonamides. Not all strains of this organism are susceptible at the erythromycin concentrations ordinarily achieved (see appropriate sulfonamide labeling for prescribing information).

Treponema pallidum—As an alternate treatment in patients allergic to penicillin.

C. diphtheriae and C. minutissimum—As an adjunct to antitoxin. In the treatment of erythrasma.

Entamoeba histolytica—In the treatment of intestinal amebiasis.

L. monocytogenes—Infections due to this organism.

Establish susceptibility of pathogens to erythromycin, particularly when *S. aureus* is isolated.

Contraindications:

Known hypersensitivity to erythromycin.

Warnings:

Safety for use in pregnancy has not been established.

Precautions:

Exercise caution in administering to patients with impaired hepatic function. During prolonged or repeated therapy, there is a possibility of overgrowth of nonsusceptible bacteria or fungi. Surgical procedures should be performed when indicated.

Adverse Reactions:

Dose-related abdominal cramping and discomfort. Nausea, vomiting, and diarrhea infrequently occur. Mild allergic reactions such as urticaria and other skin rashes may occur. Serious allergic reactions, including anaphylaxis, have been reported.

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Please see opposite page for Brief Summary.

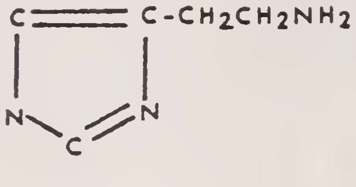
Clinical Pharmacy

Cimetidine

A Review of Clinical Trials

ROBERT J. CIPOLLE. Pharm. D.*; ROBERT P. NAVARRO, Pharm.D.† and
RONALD P. FISCHER, M.D.‡

PEPTIC ULCER DISEASE is a major public health problem affecting over 20 million people and accounting for a large number of hospital admissions. The disease produces considerable morbidity and several thousand people die each year as a consequence of penetration, perforation, or hemorrhage. Peptic ulcer disease costs billions of dollars annually, considering hospitalization, medication costs and lost income. Millions of dollars are spent on the more than 200 antacid products, the corner-stone of ulcer therapy. Soon, pharmacologic agents may offer an effective alternative to current therapy. Clinical studies have shown cimetidine, an investigational histamine (H_2) receptor antagonist, may promote ulcer healing by reducing gastric acid secretion. Additionally, preliminary data suggests cimetidine halts upper gastrointestinal hemorrhage from gastritis and/or duodenitis.



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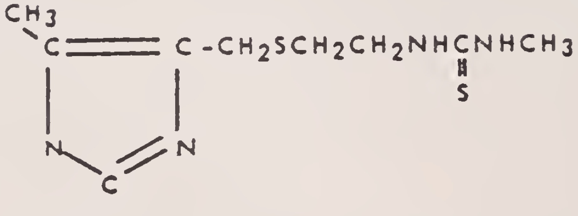

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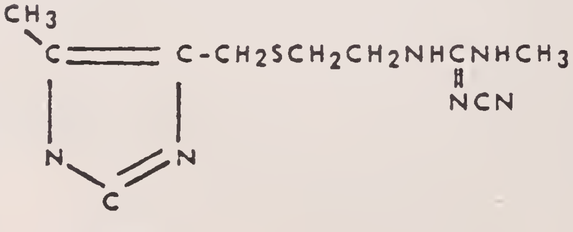

CIMETIDINE

Fig. 1—Structures of Histamine, Metiamide, and Cimetidine.

The Role of Histamine

Several physiologic factors cause parietal cell acid secretion including vagal stimulation and gastrin release. Additionally, the administration of exogenous histamine has been shown to stimulate gastric acid secretion, although the exact mechanism is unknown. Histaminic and cholinergic stimulation of the parietal cell may both be necessary for all types of gastric acid secretion.[1] Although the release of histamine from mammalian gastric mucosa has never been directly demonstrated,[2] Kahlson and Rosengren[3] indicate histamine may be released in response to acetylcholine and gastrin, and histamine may be the final mediator in acid secretion.

The Role of Antihistamines

In 1972, Black et al.[4] summarized conventional (H_1) antihistamines, such as chlorpheniramine (Chlor-Trimeton®) or diphenhydramine (Benadryl®), did not inhibit all actions of histamine. The histaminic actions not antagonized by conventional antihistamines, including gastric acid secretion, were designated "H_2." Various H_2 antagonists (cimetidine and metiamide) have been shown to inhibit gastric acid secretion. These H_2 antihistamines are not useful in H_1 reactions, such as allergic rhinitis, anaphylaxis, motion sickness, or pruritis.

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Supported in part by the Minnesota Education and Research Foundation.

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Pharmacology of Cimetidine

Cimetidine is structurally and pharmacologically similar to metiamide (Figure 1). Metiamide was studied in ulcer therapy in Great Britain but was withdrawn before effectiveness could be well established.

Cimetidine is thought to competitively antagonize histamine at the H_2 receptor of the gastric mucosal parietal cell.

Several studies in normal and duodenal ulcer patients indicate the extent and duration of acid suppression is dose related. An oral dose of 300 or 400 mg is expected to produce a 70 to 90% reduction of acid secretion for four to six hours, depending on time of administration. Henn et al.[6] found 300 mg administered on an empty stomach produced near maximal suppression of basal acid secretion throughout the four hour study. In this trial, peak suppression appeared one hour after administration. When the drug was given orally with food, the onset of acid suppression was delayed (peak effect in two hours),[7] presumable due to delayed absorption in the presence of food.[24] In addition, increased acid secretion in response to gastric distension and peptones in the diet may decrease the effect of the drug initially. In two studies, Pounder et al.[8,9] found oral administration of 200 mg before meals produced rapid acid suppression with a relatively short duration of action. Conversely, post-prandial administration produced acid suppression with a slow onset, but with a longer duration (Figure 2). Postprandial administration was considered more desirable because the cimetidine suppression was still occurring when the buffer capacity of the food was decreasing.

In a study examining nocturnal suppression of acid 300 or 400 mg administered orally on an empty stomach at 11:00 p.m. resulted in near zero acid output for seven hours as reflected by gastric pH (Figure 3).[10]

The effect of cimetidine on serum gastrin in duodenal ulcer patients is controversial. Richardson et al.[7] observed elevated serum gastrin levels in response to an increased antrum pH, while others[8,10,11] found serum gastrin levels not significantly affected. Gastric motility was not affected by a 300 mg oral dose.[7] Lower esophageal sphinctor pressure was not affected, thus the drug is not contraindicated in reflux esophagitis.[25] Pancreatic enzyme and biliary output were not affected by cimetidine.[26]

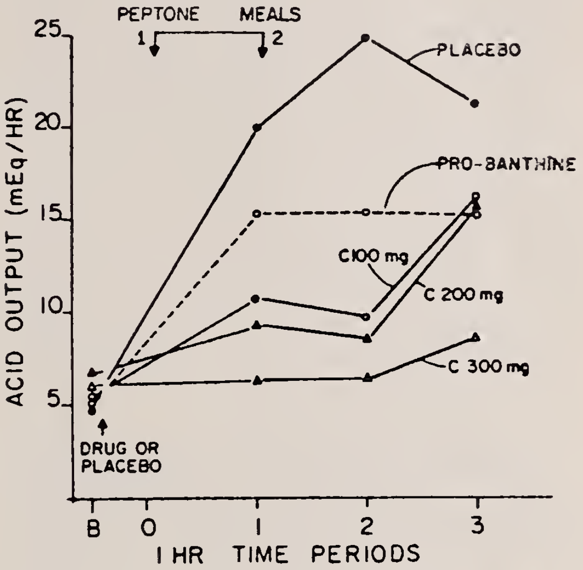

Fig. 2—Gastric acid secretion in response to cimetidine (C) 100, 200 and 300 mg, a placebo, and a maximally tolerated dose of Pro-Banthine. Two peptone meals were infused at time 0 and at 1 hour. Reprinted by permission from the New Engl J Med 293:371, 1975.

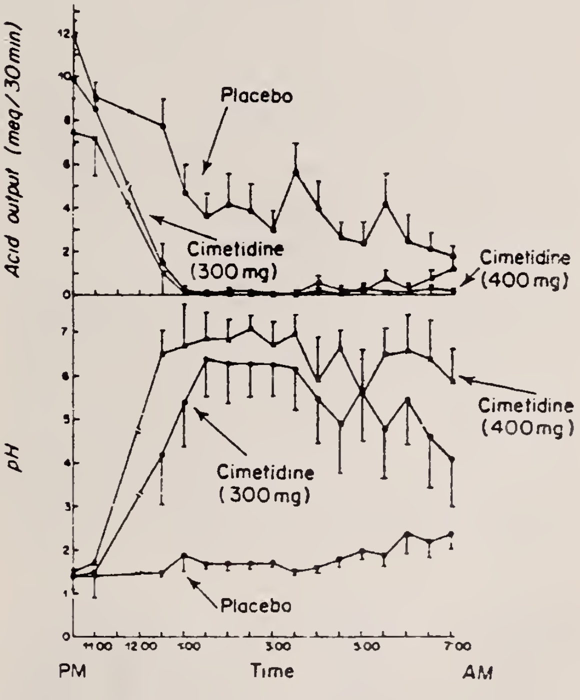

Fig. 3—Effect of orally administered cimetidine on nocturnal secretion of gastric acid, after 300 and 400 mg or placebo. Adapted, with permission, from the New Engl J Med 294:801 1976.

A few studies have attempted to correlate cimetidine blood levels with degree of acid suppression. Henn et al.[6] found a high degree of correlation, with peak blood levels of cimetidine greater than 1.0 ug/ml being associated with an 80% or more decrease in acid secretion. Pounder et al.[10] also found a correlation between blood levels of cimetidine and effect. Routine blood level monitoring is probably not necessary as a significant dose-related response has been observed with no severe side effects at normal doses. However, the significance of very high blood levels that could occur with normal doses in renal failure in not known. Blood level data may be useful if refractoriness, malabsorption, or noncompliance are suspected.

Absorption and Elimination

The pharmacokinetics of cimetidine have not been completely studied. The presently available data indicate the drug is well absorbed (70-80%) following oral administration, even in the presence of food.[17] However, food may delay absorption.[24]

Burland et al.[13] reported cimetidine has a serum half-life of approximately two hours in patients with normal renal function. In 24 hours after oral administration, approximately 70% of the drug was found unchanged in the urine. The drug is approximately 20% metabolized, and the activity of the metabolites is unknown. In severe renal failure (creatinine clearance less than 5 ml/min) the half-life increases to approximately four or five hours.[17] Preliminary information suggests the drug is partially dialyzed.[17]

Dosage

Current investigative protocol suggests a dosage regimen of 300 mg every four to six hours, given intravenously or orally. In cases of severe, uncontrollable hemorrhage, cimetidine may be administered by continuous infusion (2 to 4 mg/kg/hr) or by intermittent intravenous bolus, 300 mg to 400 mg every four to six hours.[12] In patients with decreased renal function, current dosage recommendations are as follows:[17]

Serum Creatinine	Dose	Interval
<3.5 mg%	300 mg	every 4 to 6 hours
3.5 to 5	300 mg	every 8 to 12 hours
>5.0	300 mg	every 12 to 18 hours

In patients with hepatic failure without renal failure, no dosage adjustments are recommended.

Toxicity

Early studies indicate the incidence of side-effects associated with cimetidine is low. To date the only reported observations have been transient elevations in SGOT, SGPT, serum creatinine[14] and non-progressive gynecomastia.[15] The cause and significance of these findings are not known. Metiamide was associated with several cases of agranulocytosis. Specifically, this adverse reaction seems to have been related to the thiourea moiety of metiamide (Figure 1), which, in cimetidine, was replaced by a cyanoguanidine group. The agranulocytosis associated with metiamide has not been reported with cimetidine. Burland et al.[16] reported metiamide-induced agranulocytosis reversed during treatment with cimetidine in one patient.

Clinical Trials

The long term effects of cimetidine in peptic ulcer disease or upper gastrointestinal hemorrhage have not been determined. Metiamide, in use for a longer period of time, had been used in both of these situations with success. MacDonald et al.[18] reported treating 14 episodes of upper gastrointestinal bleeding with metiamide administered via nasogastric tube. In all 11 episodes caused by erosive gastritis and/or duodenitis, bleeding promptly ceased after one or two doses of 300 mg at six hour intervals. In the two instances in which bleeding continued, chronic gastric and duodenal ulcers had eroded into major blood vessels. In unpublished studies cimetidine has also been used parenterally to control non-esophageal upper gastrointestinal hemorrhage.

A double-blinded trial compared oral cimetidine with a placebo in 24 patients with endoscopically confirmed duodenal ulcers.[14] The same antacid was used by each group. Nine of eleven patients treated with cimetidine had healed ulcers on repeat endoscopy, compared with three of twelve patients taking a placebo. The same study compared 0.8 gm versus 1.6 gm of cimetidine per day and found no difference in ulcer healing after six weeks (seven of thirteen versus five of ten respectively). Other studies have reported similar results.[21,22]

Ten patients with endoscopically confirmed gastric ulcers were given either 200 mg (six patients) or 400 mg of cimetidine (four patients) after meals and at bedtime for six weeks. On post-treatment endoscopy, all patients had healed ulcers. The results of this uncontrolled study are of unknown significance due to the high rate of spontaneous healing of gastric ulcers.[23]

H_2 antagonists are more effective than anticholinergics in suppressing acid output, because the dose of anticholinergics is often limited by side-effects such as blurring of vision, dry mouth, or urinary retention.[6] Also, anticholinergic therapy may be contraindicated in angle-closure glaucoma, benign prostatic hypertrophy, paralytic ileus, or other hypomotility states. However, there appeared to be synergy between anticholinergics and metiamide in suppressing acid secretion.[19] This synergy may not be clinically significant, as near maximal acid suppression can often be achieved with cimetidine alone. Thus, the addition of an anticholinergic agent may be unnecessary. The effect of cimetidine on antacid consumption has not been reported, but theoretically should be reduced. In a controlled trial comparing metiamide with a placebo, prn antacid consumption decreased significantly in the metiamide-treated group.[19]

Summary

Cimetidine is a new H_2 histamine receptor antagonist that produces a dose-related inhibition of gastric acid secretion. The drug may be effective in promoting ulcer healing and reducing non-esophageal upper gastrointestinal hemorrhage. Orally, 300 or 400 mg produces significant reduction of acid secretion for greater than four hours. A similar dose at bedtime will suppress nocturnal acid secretion throughout the night. A regimen of 300 or 400 mg administered with meals and at bedtime seems to be rational ulcer therapy. The use of antacids may be reduced depending on the symptoms of each patient.

In emergency situations, the drug may also be given intravenously to treat non-esophageal upper gastrointestinal hemorrhage. The only known adverse reactions are transient elevations in SGOT, SGPT, serum creatinine and non-progressive gynecomastia.

Because of the effectiveness of cimetidine in inhibiting gastric acid secretion and its failure to produce serious side-effects, cimetidine seems to be ideal as a potential therapeutic agent in patients with peptic ulcer disease. This drug is now under widespread clinical investigation by Smith, Kline and French laboratories. The proprietary name will be Tagamet.®

References

1. Walsh JH, Grossman MI: Gastrin (part 1). New Engl J Med 292:1324, 1975.
2. Beaven MA: Histamine (part 2). New Engl J Med 294:320, 1976.
3. Kahlson G, Rosengren E: New approaches to the physiology of histamine. Physio Review 48:155, 1968.
4. Black JW, Duncan WAM, Durant CJ, et al.: Definition and antagonism of histamine H_2 receptors. Nature 236:385, 1972.
5. Ivey KJ, Baskin W, Jeffrey G: Effect of cimetidine on gastric potential difference in man. The Lancet 2:1072, November 29, 1975.
6. Henn RM, Isenberg JI, Maxwell V, Sturdevant RA: Inhibition of gastric acid secretion by cimetidine in patients with duodenal ulcer. New Engl J Med 293:371, 1975.
7. Richardson CT, Walsh JH, Hicks MI: The effect of cimetidine, a new histamine H_2 receptor antagonist, on meal-stimulated acid secretion, serum gastrin, and gastric emptying in patients with duodenal ulcer. Gastroenterology 71:19, 1976.
8. Pounder RE, Williams JG, Milton-Thompson GJ, Misiewicz JJ: Effect of cimetidine on 24 hour intragastric acidity in normal subjects. Gut 17:133, 1976.
9. Pounder RE, Williams JG, Russell RCG, Milton-Thompson GJ, Misiewicz JJ: Inhibition of food-stimulated gastric acid secretion by cimetidine. Gut 17:161, 1976.
10. Longstreth GF, Go VLW, Malagelada J-R: Cimetidine suppression of nocturnal gastric secretion in active duodenal ulcer. New Engl J Med 294:801, 1976.
11. Pounder RE, Williams JG, Milton-Thompson GJ, Misiewicz JJ: 24 hour control of intragastric acidity by cimetidine in duodenal ulcer patients. The Lancet 2:1069 (Nov 29), 1975.
12. Cimetidine study protocol DO1/DO2, Smith Kline and French Laboratories, September 27, 1976.
13. Burland WL, Duncan WAM, Hesselbo T, et al.: Pharmacological evaluation of cimetidine, a new histamine H_2 receptor antagonist, in healthy man. Br J Clinical Pharmacology 2:481 (Dec), 1975.
14. Blackwood WS, Maudgal DP, Pickard RG, Lawrence D, Northfield TC: Cimetidine in duodenal ulcer. The Lancet 1:174 (Jul 24), 1976.
15. Hall WH: Breast changes in males on cimetidine (letter). N Engl J Med 295:841, 1976.
16. Burland WL, Sharpe PC, Colin-Jones DG et al.: Reversal of metiamide-induced agranulocytosis during treatment with cimetidine (letter). The Lancet 2:1085 (Nov 29), 1975.
17. Personal communication, John G Bergstrom, Associate Director, Clinical investigation, Smith Kline and French Laboratories, November 1976.
18. MacDonald AS, Steele BJ, Bottomley MG: Treatment of stress-induced upper gastrointestinal haemmorhage with metiamide. The Lancet 1:68, January 10, 1976.
19. Treatment of duodenal ulcer by metiamide. The Lancet 2:779, (Oct. 25), 1975.
20. Richardson CT, Bailey BA, Walsh JH, Fordtran JS: The effect of an H_2 receptor antagonist on food-stimulated acid acid secretion, serum gastrin and gastric emptying in patients with duodenal ulcers. J Clin Invest 55:536, 1975.
21. Haggie SJ, Fremont DC, Wyllie JH: Treatment of duodenal ulcer with cimetidine. The Lancet 1:903, May 8, 1976.
22. Bodemar G, Walan A: Cimetidine in the treatment of active duodenal and prepyloric ulcers. The Lancet 2:161, July 24, 1976.
23. Pounder RE, Hunt RH, Stekelman M, Milton-Thompson GJ, Misiewicz JJ: Healing of gastric ulcer during treatment with cimetidine. The Lancet 1:337, Feb. 14, 1976.
24. Spence RW, Creak DR, Celestin LR: Influence of a meal on the absorption of cimetidine. Digestion 14:127, 1976.
25. Freeland GR, Higgs RH, Castell DO: Lower esophageal sphincter response to oral administration of cimetidine in normal subjects. Gastroenterology 72:28, 1977.
26. Longstreth GF, Go VLW, Malagelada J-R: Postprandial gastric, pancreatic, and biliary response to histamine H_2 receptor antagonists in active duodenal ulcer. Gastroenterology 72:9, 1977.

Minnesota State Medical Association

Interview with MINNPAC Chairman, Richard E. Engwall, M.D.

This is an interview with Richard E. Engwall, M.D., chairman of the MINNPAC (Minnesota Medical Political Action Committee) Board of Directors. Dr. Engwall reports on a growing apathy among physicians in Minnesota toward membership in MINNPAC and AMPAC.

Interviewer: *Why the sudden concern, Dr. Engwall, for MINNPAC? What is the problem?*

Dr. Richard Engwall:

The immediate concern is a membership decline in recent years.

Interviewer: *What is the current membership?*

Dr. Engwall:

Well, the current figure is a little over 300, but of course we still have not reached the half-way point in 1977. But, at this time of the year we should be doing better than this.

Interviewer: *Historically, what has been the membership experience for MINNPAC?*

Dr. Engwall:

Six years ago MINNPAC membership hovered around the 1,000 mark. Since 1974, the membership has failed to reach 800, dropping to an all time low of 740 in 1975. The 1976 experience showed a slight jump to 794, but still far short of the experience in earlier years.

Interviewer: *What has been the experience in the other states?*

Dr. Engwall:

Most states have posted a steady increase in membership over the years. AMPAC membership has been growing each year for the past ten years—both during election and non-election years. This in the face of a steady membership decline of MINNPAC.

Interviewer: *Do you attribute this decline to an increase in the MINNPAC membership dues from $25 to $50 in 1975?*

Dr. Engwall:

There is no question that whenever you increase dues you temporarily lose some members. The curve does drop, but then it

should start back up again. We're not really experiencing that reversal. Also, Minnesota is not unique in increasing its PAC dues. Most states have done this ,and few have experienced the continuing decline in membership figures that we have.

Interviewer: *Have you analyzed the problem, Dr. Engwall? Why are we losing members?*

Dr. Engwall:

If I were to point to the single most important problem, it would be that we have grown apathetic in our support of the PAC movement. You must remember that MINNPAC and AMPAC are voluntary organizations, and membership dues are not as automatic as membership in a county medical society, the Minnesota State Medical Association, and the American Medical Association. That is not to say that membership in organized medicine is automatic, but it takes much more work to motivate physicians to join the PAC. Again, we are not unique in that respect. The job of recruiting and retaining PAC membership in all states is a continuing project. Our problem is that we have given lip service over the years to MINNPAC, but have not really, especially in recent years, fully committed ourselves to the project.

Interviewer: *In other words you need a recommitment to MINNPAC?*

Dr. Engwall: That is exactly right.

Interviewer: *There is no real antagonism towards MINNPAC?*
Dr. Engwall:

No, oh there are a few of our colleagues who have not yet, and probably never will, recognize the way in which medicine will be practiced in the future is directly determined by the legislative process, and if physicians are not going to become involved in that process there is no way that legislative function will be reflective of the needs of the medical profession. But the real problem is not antagonism, it is just a general apathy among the leadership of our Association.

Interviewer: *What do you mean by the leadership?*

Dr. Engwall:

As you look at other states where the PAC has been and is continuing to be a successful project, what you find is that the primary medical leadership of the state medical association is firmly committed to the state PAC and AMPAC, and the impetus for joining these organizations comes from that leadership. You see,

MINNPAC cannot operate in a vacuum. It must have a continuing commitment and support of the leadership of the Minnesota State Medical Association. And I do not mean lip service support. I mean the kind of direct commitment that it takes to encourage colleagues to join the organization. After all, the leadership of the Minnesota State Medical Association created MINNPAC, and if it is going to survive, it is primarily up to that leadership to urge physicians throughout the state to support the concept. MINNPAC's Board Members cannot do it alone. Staff certainly can't do it. The responsibility squarely rests on the shoulders of the leadership of the Minnesota State Medical Association.

Interviewer: *Hasn't the Council of the Minnesota State Medical Association, through the years, provided educational dollars for supporting the administrative costs of MINNPAC?*

Dr. Engwall:

Absolutely. MINNPAC has been grateful for this support, and it points up my earlier comment that what we are experiencing is not a feeling of antagonism but a general apathy. What we need is a renewed commitment to not only provide those dollars but to individually and collectively work to strengthen MINNPAC where it counts most—recruiting new members and retaining existing ones.

Interviewer: *Do you have any projects in mind to strengthen this leadership commitment?*

Dr. Engwall:

Yes, we asked that the MSMA Council join with the MINNPAC Board during the MSMA Annual Meeting, May 18-20, 1977. One of the first things we need to do is to sit down, very candidly discuss this problem, and see a renewed commitment to MINNPAC. We are hopeful that we can have that kind of Board-to-Board opportunity to exchange views, and I would hope that we could do this on an annual basis. In addition, we are going to ask that the MINNPAC Chairman be invited to attend meetings of the Socio-Economic Board and Council on a continuing basis. Perhaps most important, we plan to direct a special effort toward those individuals in the MSMA leadership who are not currently members of MINNPAC. Fortunately most of MSMA officers, councilors, and members of the House of Delegates are members of MINNPAC. However, not a single physician in these three leadership categories is MINNPAC sustaining members for either 1976 or 1977.

Interviewer: *Exactly what is a sustaining membership in MINNPAC?*

Dr. Engwall:
The difference really is $50. Our active membership category is $50. Ten dollars of this goes to AMPAC, and the remaining $40 stays with MINNPAC for use in state legislative and congressional campaigns. A sustaining membership provides us with an additional $50. Historically, the medical leadership in the states around the country has been sustaining members. For example, most of the AMA leadership on its Board of Trustees, and AMA officers are sustaining members of AMPAC and their state PAC. The act of becoming a sustaining member is a visible sign by a physician in an association leadership position to show his or her commitment to the PAC movement. This is why we want to sign up sustaining members among our MSMA leadership. Currently, we have none.

Interviewer: *What are you going to do about the overall membership recruitment program?*

Dr. Engwall:
We are very excited about our plans to take a concentrated period of time (May 23-June 23) to mount a massive membership campaign for MINNPAC and AMPAC throughout the state of Minnesota. Our plan is to use physicians' spouses in every county medical society to serve as the means of approaching individual physicians and their spouses for membership in MINNPAC and AMPAC. The best way to sign up physicians for a membership is to approach them on an eyeball-to-eyeball basis.

Interviewer: *That is going to be pretty difficult especially in Hennepin and Ramsey counties.*

Dr. Engwall:
You are right. We estimate that in Hennepin County we will require something like 40 or 50 physicians' spouses to serve on a team to meet with physicians in their offices.

Interviewer: *Do you plan to use the telephone on this project?*

Dr. Engwall:
That is our second choice. We are going to tell our volunteers that the first effort should be to approach our people on a face-to-face basis. Failing that, we would recommend the use of the telephone.

Interviewer: *What types of materials will be developed for this campaign?*

Dr. Engwall:
Well, we are developing a manual for our volunteers to help

them with the "eyeball-to-eyeball" campaign in their counties. In addition, we will have a new MINNPAC brochure with a tear-off tab for the physician to either join on the spot or request that he or she be billed. The tab will also provide an opportunity for a physician who does not wish to join to indicate why. In those cases, we will respond to those physicians in writing to answer their criticism of MINNPAC.

Interviewer: *Certainly sounds like an ambitious project.*

Dr. Engwall:

It is, and we are hopeful that we will be able to mount an active campaign in every county medical society.

Interviewer: *What is the general reason given for not joining MINNPAC and AMPAC?*

Dr. Engwall:

I believe that most physicians and their spouses do not have any idea as to the number of legislative and congressional candidates who are supported by MINNPAC in their behalf or the ratio of that support—Republicans and Democrats.

Interviewer: *What is the ratio?*

Dr. Engwall:

Last year in the 1976 elections, MINNPAC provided dollar support to 51 individuals running for the Minnesota Legislature. Twenty-four of them were of DFL persuasion, and 27, Independent Republican. This is pretty much a fifty-fifty split between the two parties. So those who claim that MINNPAC is a Republican organization can see that this is simply not true. Over the years we have moved more and more towards this type of balance in our campaign giving.

Interviewer: *What was MINNPAC's record in the 1976 election?*

Dr. Engwall:

Well, we were successful in 22 of the 24 DFL races where we provided support and were successful in 14 of the 27 Republican races. In other words, we were successful in 36 of the 51 races. This is an excellent success ratio.

Interviewer: *Who actually does MINNPAC support both in the Legislature and in Congress?*

Dr. Engwall:

I want to point out that we don't keep this information secret. We can't. We are required by law to file reports so that this information is public. I invite any individual to contact me or our MINNPAC office at area code 612 227-1342, and we will provide whatever information is requested.

Interviewer: *Will we be hearing more about this special membership recruitment campaign for MINNPAC?*

Dr. Engwall:

You certainly will. We will be reporting on this campaign in future issues of MINNESOTA MEDICINE and other publications of the Association. In addition, we will be communicating with physicians and their spouses by letter throughout the state on this exciting program. I hope that the medical profession in Minnesota will give us their support in the most tangible way possible—by joining MINNPAC and AMPAC.

Interviewer: James Rosevear, Assistant Executive Vice President MSMA Division of Socio Economics.

Photographer: Commercial.

MINNESOTA MEDICINE

The Board of Editors of MINNESOTA MEDICINE invites the members of the Minnesota State Medical Association to submit examples of their art work for publication on the cover of MINNESOTA MEDICINE. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of MINNESOTA MEDICINE, 101 East 5th St., Suite 900, St. Paul, Minnesota 55101.

Farrell Stiegler, M.D.
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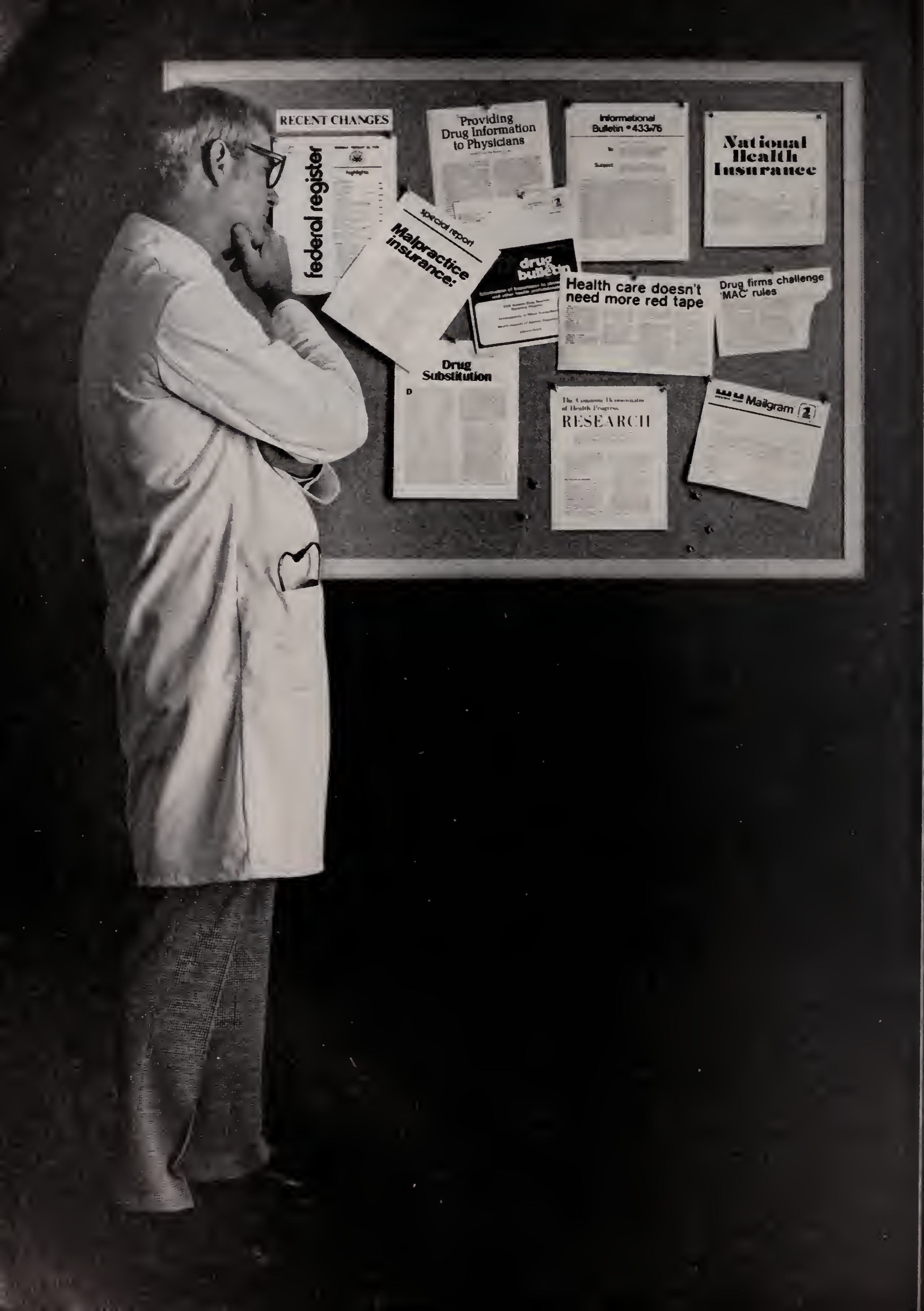
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The worry is that in the wake of this focus, the relaionship between you and your patient will be weakened, ithout offsetting benefits. Consider three examples:

Drug substitution In most states, pharmacy laws, gulations or professional custom stipulate that your on-generic prescriptions be filled with the precise prodcts you prescribe. But in the last five years, a dozen or ore State laws have been changed, permitting the pharacist in most cases to select a product of the same eneric drug to fill any prescription.

Ironically, this dilution of physician control has ken place against a background of growing evidence at purportedly equivalent drug products may be inquivalent, since neither present drug standards nor their nforcement are optimal. In fact, the FDA itself says it as not enforced the same standards for hundreds of follow-on" products that it had applied to the original DA approvals. Thus physician control over patient erapy is being eroded with a risk that patients may be xposed to drugs of uncertain quality.

The major advertised claim for substitution is reduced rescription prices for consumers. Yet no documentation f any significant savings has been produced.

MAC Maximum Allowable Cost, MAC for short, is Federal regulation designed to cut the Government's rug bill by setting price ceilings for drugs dispensed to edicare and Medicaid patients. Unless the prescriber ertifies on the prescription that a particular product is edically necessary, the Government intends to pay only or the cost of the lowest-priced, purportedly-equivalent, generally-available product. The effect of the program may be that elderly and indigent patients will be restricted to products which someone in Washington believes are priced right. Practicing doctors will have little to say about administration of the program, since Government will have absolute authority to make its choices stick.

The drug lag The future of drug and device research depends upon a scientific and regulatory environment that encourages therapeutic innovations. The American pharmaceutical industry annually is spending more than $1 billion of its own funds and evaluating more than 1,200 investigational compounds in clinical research. Disease targets include cancer, atherosclerosis, viruses and central nervous system disorders, among others. But there is a major barrier to the flow of new drugs to your patients: The cost of the research is more than ten times what it was, per product, in 1962; and whereas governmental clearance of new drug applications took six months then, it commonly consumes two years now.

The FDA needs adequate time, of course, to consider data. But it is equally clear that the present approval process contributes to needless delay of needed therapy. That's why the increased efficiency of the drug approval process is vital to all our futures.

If these issues concern you, we suggest that you make your voice heard—among your colleagues and your representatives in State legislatures and in Washington.

It could make a difference in your practice tomorrow.

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Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: In the elderly and debilitated, and in children over six, limit to smallest effective dosage (initially 10 mg or less per day) to preclude ataxia or oversedation, increasing gradually as needed and tolerated. Not recommended in children under six. Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider individual pharmacologic effects, particularly in use of potentiating drugs such as MAO inhibitors and phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions (*e.g.*, excitement, stimulation and acute rage) have been reported in psychiatric patients and hyperactive aggressive children. Employ usual precautions in treatment of anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation have been reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship has not been established clinically.

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Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

***Usage in Pregnancy:* Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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President's Letter

The Commission on Health Care Costs

Last month I referred to the three things I consider most important for the MSMA to approach in the next three to five years. Let's consider the first: Health Care Costs. Unfortunately the politicians, the public, and the press lump them all together and ask the medical profession why they do not do something about the 139.3 billion dollars the American public spent last year for health care costs. This is never broken down in the public print to show what part of the health care dollar goes to physicians. A little better than 18 percent is the latest quoted figure. Better than 80 percent of the 139.3 billion dollars goes for hospital care, nursing home care, home health care costs, over the counter purchases by the consuming public for health remedies, and so forth. Is this an alarming amount? Certainly it is. But are we really getting more publicity about the high cost of health care, because the government is paying an ever increasing amount of that health care cost?

In 1965 the year before Medicare was passed, the public sector paid 75 percent of the health care cost; the federal government paid 12 percent; and state and local governments paid 13 percent of the total 38.9 billion dollars. Today the private sector pays 50 percent; state and local taxes pay 14 percent; and the federal government, one way or another, pays 36 percent. A three-fold increase of total payment by the federal government since 1965.

Medicare and Medicaid were voted in by the congressmen, and organized medicine at that time told them that the estimated cost of three billion dollars was lower than the cost actually would be. Even in 1965, it was a false estimate. Today, with inflated costs, it has soared to 36 percent of 139.3 billion dollars or about 39 billion dollars a year.

What's the reason for the soaring costs, and what can we do about them? Your MSMA has established a Commission on Health Care Costs to see if something can be done about the soaring costs in Minnesota. This Commission will be made up of 21 members: providers of hospital and medical care, government, insurance, labor, economists, business, industry and allied health organizations. The Chairman of the Commission will be Dr. Richard J. Frey, Chairman of the Council of the Minnesota State Medical Association, and James Rosevear, the Assistant Executive Vice-President; Division of Socio-Economic Affairs of the Minnesota State Medical Association, will help staff the Commission.

The Commission's charges will be: (1) a definition of the health care systems in Minnesota, (2) identification of the forces at work in Minnesota and throughout the country that increase health care costs, (3) review and evaluation of existing research on the cause of health care costs escalation, (4) Review of health care systems in Minnesota outside of the traditional fee for service system, and (5) detailing a recommendation for future programs of health delivery to contain health care costs in Minnesota while providing quality care to the public.

The life of the Commission will be about 18 months and the findings of the Commission will be presented to the Minnesota State Medical Association and to the public.

I feel that, again, this is a manifestation of the responsibility that you and your state organization accepts in an attempt to hold down health care costs. It would be premature to judge what the Commission's final findings will be, but I am confident inflation will be one of the larger causative factors.

Freidman's economics tells us that inflation is caused solely by government. Printing more money than you have goods, and services to utilize that money makes for inflation. The ever increasing use of third party payers takes the direct responsibility for payment off the backs of those who utilize the services.

Medicare and Medicaid, beneficent as they may be, have through the ever burgeoning government rules and regulations helped to escalate the increased cost of health care. New technology in the entire field of medical care has certainly increased quality and costs. A glaring example of this is the increased use of kidney dialysis, which; first started out with Medicare for those over 65 and finally through Congressional action in 1972 covered patients with kidney failure at any age. The bill to the taxpayers last year was 350 million dollars for 22 thousand recipients.

I do not wish to imply that I stand in judgment whether or not this was a proper decision of government. It is only presented here to demonstrate the multiple factors that must be considered.

Rapidly escalating health care costs are a problem to all: government, the paying public, and physicians. The causes are, I am sure, multifaceted, and the solutions must be the same.

The findings of the Commission will be well researched, and hopefully practical in helping to solve the problem.

C. A. Anderson MD

C. A. Anderson, M.D.
President

1978 MSMA Annual Meeting

Set for Duluth—May 11-12

Picturesque Duluth and the opening weekend of fishing are two added features for the 1978 Minnesota State Medical Association Annual Meeting. The meeting is set for May 11-12 with the House of Delegates gathering May 10.

The dates were selected to take advantage of the opening weekend of fishing, according to Stuart Thorson, M.D., Minneapolis. Dr. Thorson became chairman of the sub-committee on Scientific Assembly in June, replacing Robert Semsch, M.D., Wayzata, who has headed the committee for the past four years.

The meeting, MSMA's 125th annual meeting, will be held in the Duluth Arena-Auditorium which is currently undergoing expansion to make it even more suitable for such sessions. Also, a new 600-guest hotel, the Normandy, is under construction and will be in operation by meeting time. The Normandy will connect to the Arena providing accomodations and meeting space under cover.

Editor's Notebook

Editor's Report to the House of Delegates

This is my third report to you.

I gave my first report in May 1975, after I had been Editor for four months. Then I simply said I would try to maintain the Journal's prestige and to keep it financially sound.

My second report in May 1976 was more venturesome. I even voiced a few ambitions: (1) to publish four to six bicentennial articles on Minnesota's role in American Medicine, (2) to provide monthly space for the new Department of Socio-Economic affairs, and (3) to interview Minnesota State Medical Association leaders and publish those interviews.

In both those reports, I spoke of what the journal cost the previous year, of how well we had met our projected budget, of how much money we wanted for next year, and of what we had in our minds for the future.

I shall do so again now:

Year	Budget	Financial Picture
1975	$40,000	$1,163 under budget
1976	$44,000	932 under budget
1977	$46,000	432 over budget through April 1977
1978	$49,000	request for 1978 (pending approval by the House of Delegates)

As you can see, I am asking for a $3,000 increase in 1978, which would be 6.5 percent more than 1977.

Why?

First, starting with the February 1977 issue, our printer, Davidson Printing of Duluth, raised our rates 10 percent. In February, this increase came to $470 and in March to $440. If you project these increases for a year, they will amount to $5500 more a year. Incidentally, our printer's bill so far this year is up from $10,923 to $11,941—a 9.3 percent hike.

Secondly, beginning in August 1977, our printer is converting from letterpress to offset printing. After August, the journal will be set in type in Minneapolis and printed in Duluth, rather than having the whole job done in Duluth. Coordinating type setting and printing in two locations will require more mailing and handling expenses. How much more, I'm not sure. But there is an element of uncertainty, and I'm trying to cushion our budget to take care of the uncertain amount of inevitable increases.

Thirdly, we have expanded MINNESOTA MEDICINE's coverage of socio-economic, and political affairs that influence Medicine and physicians' practices. As I said in last year's report, the Journal's aim should be to inform and educate Minnesota's physicians about what's going on within the Association and in the world outside.

Last year, we devoted this number of pages to affairs of socio-economic or political significance.

Number of Pages (May 1976-May 1977)		Estimated Approximate Expense ($60.25/page)
Monthly section for Division of Socio-economic Affairs	83 pages	$5000
Editor's Notebook devoted to socio-economic, or managerial issues	25 pages	$1500
Interviews with Association leaders (Anonsen, Frey, Diessner)	23 pages	$1400
Total	131 pages	$7900

Fourthly, our advertising revenues, sad to say, have declined the first three months of 1977.

	First Three Months	
	1976	1977
Local Ads	$1851	$1614
National Ads	8582	6546
Total	$10433	$8260

So there you have the dark side. But there are bright spots, too. Let me take the highlights in this order:

(1) Through our own initiatives, the advertising picture the rest of the year looks much better. We have a new national advertising representative, and we have raised our national rates by 10 percent. Also, after a six-month search, we have taken on a local media representative on a commission basis. The local man has been working barely a month, and he has already increased our local advertising net income (after commissions) by $1307 a month. He has obtained 15 new ads. Six of these will run six months, and three for three months. At current projections, our local advertising revenues will increase roughly $10,000 over last year. At this writing, the increase (or decrease) in national advertising is unpredictable.

(2) We have modestly increased subscription rates to all categories of subscribers except for members of the Association.

(3) Our classified advertisements have gone from two to three pages per monthly issue. One more page a month amounts to $2000 more a year.

(4) Finally, and most important to the Board of Editors, our soundings in the field indicate Association members appreciate our emphasizing society and government related themes and our maintaining a high level of scientific excellence. Many members have commented favorably on my series of editorials on the United States Health System. And certainly, our interviews with Association leaders have been well received. So well received, in fact, that next year we plan interviews with Doctor George Martin, AMA Delegate from Thief River Falls (scheduled for August issue); Doctor Chet Anderson, President of the Association; Doctor Robert Kelly, Chairman of the Minnesota AMA Delegation; Doctor Robert Bergan, the Association Councilor from Duluth; Doctor Al Sullivan of the Medical Admissions Committee of the University of Minnesota; and Mr. Carl Platou, Chief Executive Officer of the Fairview-Southdale

Hospitals in Minneapolis. We may also interview Minnesota physicians about their lives in rural, city, and suburban practice; their opinions about controversial medical and social issues; and their hopes for the future.

Richard L Reece MD

Continuing Medical Education

Bethesda Lutheran Hospital

Bethesda Lutheran Hospital in cooperation with the College of St. Thomas announces the John R. Sebald M.D. Memorial Hand Symposium, Friday, September 30, 1977, at the College of St. Thomas from 8:30 A.M. to 5 P.M. Approved for Category I credits, AMA, Am Acad Family Practice and ANA.

Speakers, Joseph Kutz, M.D., University of Louisville; Richard Burton, M.D., University of Rochester, New York; Donald Serafin, M.D., Duke University and Charles J. MacDonald, M.D., St. Paul, Minn. will cover hand topics of interest to all practitioners, and will include tendon injuries, rheumatoid arthritis, finger tip injuries, neuropathies and microsurgery.

For program send to Chris P. Tountas, M.D., Bethesda Lutheran Hospital, 559 Capitol Boulevard, St. Paul, Minnesota 55101.

St. Paul Rehabilitation Center

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Workshop—September 16, 17, 1977

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Candida Endocarditis with Distal Aortic Embolization

SULEYMAN GULMEN, D.D.S., M.S.D.* and W. ROBERT ANDERSON, M.D.†

A case of mitral valve endocarditis from Candida albicans in a 54-year-old female is described. The ensuing fungal emboli resulted in occlusion of the distal aorta and both common iliac arteries. The occlusion of these major arteries produced signs and symptoms resembling the Leriche syndrome.[1]

THE PURPOSE OF THIS paper is to report a case of Candida albicans mitral valve endocarditis that resulted in embolic vegetations that occluded the distal aorta and both common iliac arteries. Although arterial embolization from fungal endocarditis is common, embolization to the above sites is a rare event and may result in pain and signs of ischemia.

Case Report

A 54-year-old female was hospitalized for three months after extensive injuries from an automobile accident. When admitted she had multiple rib fractures and a fractured pelvis and an exploratory laparotomy disclosed lacerations of the liver, spleen, left kidney and hemorrhage into the left adrenal gland. A splenectomy, left adrenalectomy, left nephrectomy, and partial hepatectomy were performed. Her post-operative course was complicated by transient jaundice, fever, and episodes of pneumonitis. Treatment included hyperalimentation for one week, Keflin, Gentamicin, and Solucortef.

A second laparotomy was performed three weeks later for small bowel obstruction secondary to abdominal adhesions. Two weeks post-operatively, she developed acute tubular necrosis and deteriorating renal function necessitating hemodialysis. Hyperalimentation was continued for the ensuing three weeks during which time standard catheter care was employed. This consisted of flushing with 1 mg Amphotericin B one to two times daily, and a daily change of dressings containing Neosporin, Bacitracin, and Polymyxin B.

She continued to have febrile episodes, and approximately two months antemortem, blood cultures became positive for Candida albicans that was unresponsive to therapy. Chemotherapy included Streptomycin B as well as the frequent administration of Gentamycin, Chloromycetin, and Keflin in varying combinations for gram negative bacteria cultured from the sputum and urine. She subsequently developed a grade II/IV systolic murmur at the apex and along the left sternal border followed by increasing cerebral dysfunction suggestive of multiple cerebral emboli originating from a mycotic endocarditis. Five days antemortem, she developed the rapid onset of pallor of both lower extremities associated with absence of femoral pulses. Her condition deteriorated rapidly over the next few days, generalized seizures ensued, and she expired following a cardiorespiratory arrest on her 92nd hospital day.

Necropsy

Gross Findings

The principal abnormalities involved the heart, aorta and iliac arteries, brain, lungs, and right kidney. The heart had a generalized fibrinous pericarditis and an extensive mycotic endocarditis involving the tricuspid and mitral valves. This was characterized by large, friable, yellow-gray vegetations that were loosely adherent to these leaflets. Vegetations were most prominent along the mitral valve and ranged from 0.5 to 1.9 cm. in size (Figure 1). Those attached to the tricuspid valve leaflet were considerably smaller averaging approximately 2 mm. in diameter. The vegetations yielded a heavy growth of Candida albicans on culture.

Both iliac arteries proximally were occluded by embolic vegetations that were loosely adherent to the in-

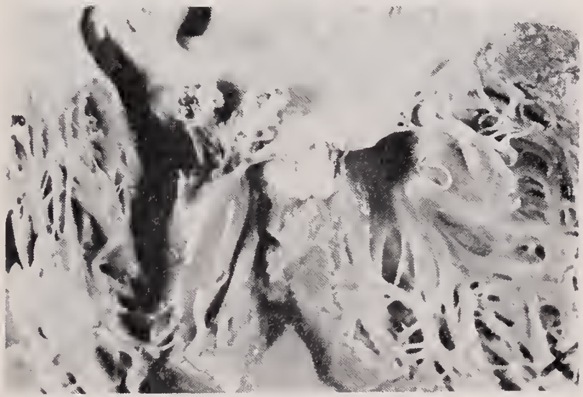

Fig. 1—Large pedunculated vegetations of the mitral valve.

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†Professor of Pathology, Department of Pathology, Hennepin County Medical Center and the University of Minnesota School of Medicine, Minneapolis, Minnesota.

tima. Thrombotic material adherent to these extended proximally into the bifurcation of the aorta (Figure 2). The left renal artery orifice was also occluded by embolic vegetation. Notably early gangrene of both legs was associated with these changes.

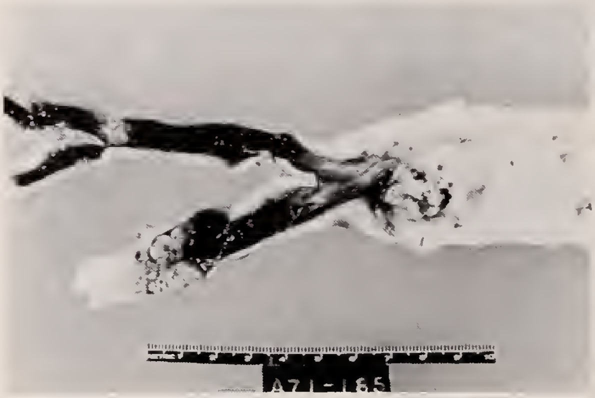

Fig. 2—Distal aorta and iliac arteries occluded by vegetative emboli to which is attached thrombotic material.

The brain externally had asymmetry of the cerebral hemispheres, bulging of the right temporal-parietal area, and multiple focal areas of yellow-gray discoloration having a predilection for the posterior portions of the brain. Two extensive areas of encephalomalacia were evident in coronal sections. There was a 6 x 3 x 2 cm. area of septic encephalomalacia with abscess formation in the right temporal lobe. A second area of 6 x 4 x 1.5 cm. hemorrhagic encephalomalacia involved the convolutional white matter of the left inferior temporal gyrus and was probably caused by a ruptured mycotic aneurysm (Figure 3). Two additional 1 cm abscesses were present in the cerebellum.

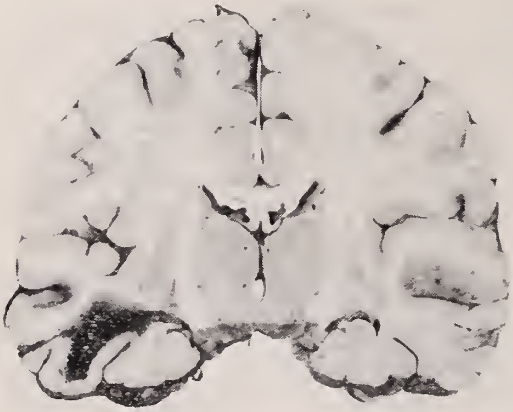

Fig. 3—Coronal sections of brain demonstrating mycotic encephalomalacia in the right temporal lobe and hemorrhage probably due to a ruptured mycotic aneurysm in the left temporal lobe.

The lungs together weighed 1400 grams and were the site of multiple abscesses. The remaining right kidney weighed 350 grams, was swollen and disclosed numerous abscesses and necrosis of the majority of papillae.

Microscopic Findings

Histologic sections of tricuspid and mitral valves disclosed vegetations to be loosely attached to the valve leaflets. These were comprised of densely packed spores of Candida albicans interlaced with an eosinophilic, amorphous material. Occasional spores demonstrated germinating short and elongated promycelia (Figure 4). Sections of emboli from the iliac arteries were identical to the heart valve vegetations (Figure 5). Multiple mycotic micro-abscesses were present throughout the myocardium. A luxuriant growth of Candida albicans was also readily demonstrated by the periodic acid-Shiff stain in lesions evident grossly in the brain, lungs, and right kidney.

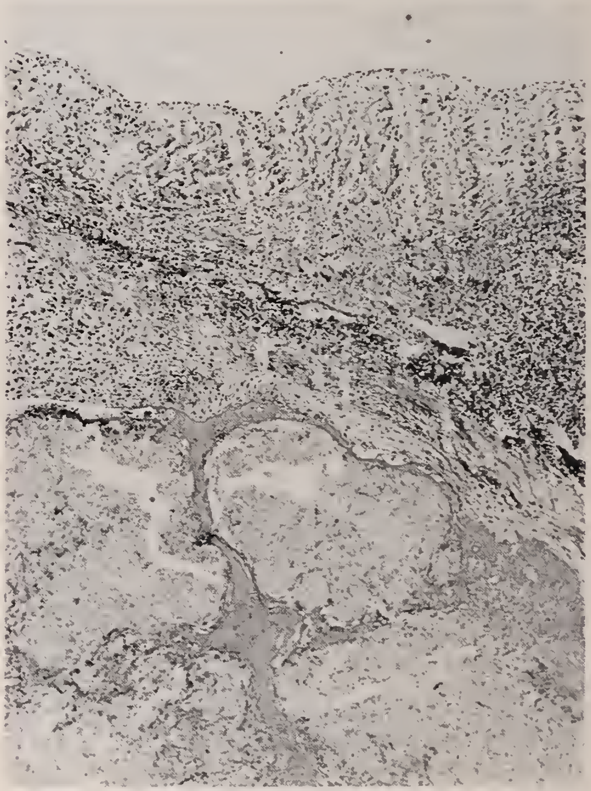

Fig. 4—Histologic section of mitral valve (upper) demonstrates vegetations (lower) to be comprised mainly of colonies of Candida albicans (H & E x 90).

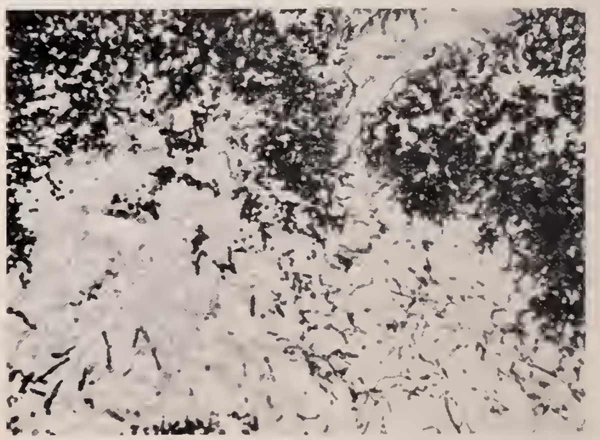

Fig. 5—Iliac artery embolus demonstrating spores of Candida albicans and promycelia (PAS stain x 350).

There was no indwelling catheter at necropsy. The appearance of the catheter was unremarkable and was not cultured.

Discussion

The first case of Candida endocarditis was reported by Joachim and Polayes in 1940.[2] It occurred in a drug addict. In 1958 Merchant and his colleagues reported 34 cases of mycotic endocarditis from the literature.[3] Most of the patients were severely debilitated; five were morphine addicts, eight had long-term antibiotic therapy and in nine the endocarditis was secondary to a generalized infection. The most common etiologic agent was Candida albicans.

The first case of Candida endocarditis following open-heart surgery was reported by Koelle and Pastor in 1956.[4] The incidence of fungal endocarditis has increased in recent years as an important complication of open-heart surgery. Major emboli occur frequently in patients with fungal endocarditis.[5]

Review of the literature revealed only two previously reported cases of Candida endocarditis that embolized to the distal abdominal aorta and occluded the iliac arteries. Newsom et al.[6] described a 20-year-old female with congenital aortic stenosis who developed a fatal Candida infection following aortic valvulotomy.

McConnell and Roberts[7] have reported three cases of Candida endocarditis as a complication of open-heart surgery. Their first patient was a man aged 53 years who became febrile shortly after aortic valve homograft replacement for aortic stenosis. Two months after surgery a saddle embolus lodged to the distal abdominal aorta and iliac arteries producing ischemic changes in lower extremities. Embolectomy was performed and culture of the specimen as well as histological examination revealed Candida albicans. Despite Amphotecin B therapy his condition deteriorated and he died three months following surgery. Postmortem examination revealed a large heart with friable vegetations on the aortic valve. At the embolectomy site there was a leaking false aneurysm. A blood clot and large, soft, friable vegetations containing Candida were obliterating the lumen of the distal abdominal aorta and iliac arteries.

Literature review revealed three additional cases having similar manifestations but in whom mycotic emboli had by-passed the aortic bifurcation to lodge in the iliac arteries. A patient with a perforated peptic ulcer reported by Caplan,[8] developed fungal endocarditis with embolization of vegetations to the eternal iliac arteries. The patient had had severe pain in the left leg, intermittent claudication, and absent left femoral artery pulsation. The postmortem examination revealed polypoid vegetations on the mitral valve and fungal emboli that occluded external iliac arteries, bilaterally. The fungus histologically was consistent with Candida albicans, although culture was not obtained.

Andriole, et al.[9] in 1962 reviewed fifteen cases from the literature and added six of their own. Two of these (Cases 20 and 21) had Candida endocarditis with mycotic emboli in the iliac arteries unilaterally. These cases are illustrative of the predilection for mycotic endocarditis to develop in patients following cardiac surgery, debilitating disease, and prolonged antibiotic therapy. The portal of entry is probably contamination of the surgical site in some instances.

In the patient described in this report, contamination of the cannula used for hyperalimentation was suspected. Furthermore, the large friable vegetations characteristic of fungal endocarditis may fragment into emboli of sufficient size to occlude major aortic branches particularly those of the lower extremity resulting in pain and signs of ischemia.

References

1. Lcriche R: De la resection dir carrefour aortico-illiaque avec double sympathectomic lombaire pour thrombose de l'aorte: Le syndrome de l'obliteration termino-aortique par arterite. Presse Med 48:601, 1940.
2. Joachim H and Polayes SH: Subacute endocarditis and systemic mycosis (monilia). JAMA 115:205, 1940.
3. Merchant RK, Louria DB, Geisler PH, Edgcomb JH and Utz JP: Fungal endocarditis: Review of the literature and report of three cases. Ann Intern Med 48:242, 1958.
4. Koelle WA and Pastor BH: Candida albicans endocarditis after aortic valvulotomy. New Eng J Med 255:997, 1956,
5. Utley JR, Mills J, Hutchinson JC, Edmunds LH, Sanderson RG and Roe BB: Valve replacement for bacterial and fungal endocarditis. A comparative study, Circulation 48:42, 1973.
6. Newsom SWB, Lee WR and Rees JR: Fatal fungal infection following open-heart surgery. Brit Heart J 29:457, 1967.
7. McConnell EM and Roberts C: Pathological findings in three cases of fungal endocarditis complicating open-heart surgery. J Clin Path 20:555, 1967.
8. Caplan H: Monilial (Candida) endocarditis following treatment with antibiotics. Lancet 2:957, 1955.
9. Andriole VT, Kravetz HM, Roberts WC and Utz JP: Candida endocarditis. Clinical and pathologic studies. Am J Med 32:251, 1962.

Severe Salicylate Intoxication in Small Children

A Practical Approach to Therapy

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R. L. SIMMONS, M.D.;* J. S. NAJARIAN, M.D.;* and C. M. KJELLSTRAND, M.D.*

Experience with the highest salicylate levels ever reported (96 mg% 24 Hours post injestion) in a 22 kg child exemplifies a practical, as yet untried, combined (four fold) approach to therapy. We combined segmental approaches to salicylism resulting in an efficient regimen for therapy of small children with severe salicylate toxicity. These severely toxic children are generally in major clinical distress. The long time between injestion and presentation usually precludes early administration of emetics or activated charcoal; however, after the child is intubated both emetics and cathartics with subsequent charcoal administration may be helpful. Initial alkaline diuresis is important but equally important is the early peritoneal instillation of dialysate—albumin solution to further remove and bind the salicylate to protein within the peritoneum while hemodialysis is arranged. The protein binding of salicylate within the peritoneal cavity competes with that which occurs in the blood and thus promotes a greater flux of salicylate into the peritoneum for binding on the unbound sites of the administered albumin. A large bore jugular central venous line is immediately placed and sodium bicarbonate administered with lasix to produce an alkaline diuresis. Directly thereafter 50 cc's/kg peridial with2 gm/kg albumin and 5 mEq/l potassium are instilled into the abdominal cavity. The hemodialysis unit is notified and a second large bore catheter is percutaneously placed in the femoral vein for dialyzer blood supply while the jugular line serves as the blood return port. The peritoneal instillation of protein-dialysate and the alkaline diuresis provide immediate and efficient salicylate removal while hemodialysis is begun. The protein binding of salicylate by albumin within the abdominal cavity appears to play a major role. Approximately two hours later while hemodialysis continues, the peritoneal contents are drained and the cycle begun again if levels indicate the need. Otherwise the alkaline diuresis continues to augment salicylate removal during and after dialysis. The post dialysis alkaline diuretic effect prevents rebound elevation of serum salicylate and obviates the need for further dialytic therapy.

SALICYLISM IS BY far the leading cause of accidental poisoning in the pediatric age group. Young children are particularly sensitive to the accumulation of organic anions such as acetoacetate and B-hydroxybutarate. While toxic blood levels of these substances seldom produce loss of consciousness in adults, they frequently cause life threatening coma in children.[3,12,15-17]

Previous experience has shown hemodialysis to be a most effective treatment in adults, removing salicylate three to five times faster than diuresis, four times faster than peritoneal dialysis or exchange transfusion, five to seven times faster than normal renal excretion and about twice as fast as resin hemoperfusion.[4,10,12,15,19] Similarly, hemodialysis is desirable in desperately intoxicated children; however, serious time delays prior to the actual accomplishment of hemodialysis[6,7] may be unavoidable. This delay is most often due to technical problems related to the assembly of pediatric dialysis equipment[1,9,11,13,14,18] and the gaining of adequate blood access[1] for hemodialysis in the very small child.

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This report demonstrates how the properly timed and combined use of: (1) intraperitoneal albumin injection for protein binding of salicylate, (2) immediate initiation of peritoneal dialysis, (3) early alkaline diuresis, and finally (4) hemodialysis can produce the smooth recovery of a severely intoxicated and comatose child without rebound elevation salicylate levels or the need of repeated hemodialysis treatment.

Case Report

A 22 kg, four-year-old girl presented with a salicylate level of 96 mg percent some 24 hours post ingestion. On admission to the University Hospital emergency room she was in coma and displayed hyperpnea, hyperpyrexia, plethora, dehydration, and oliguria.

Fluid replacement, sodium bicarbonate, and potassium chloride, were administered via a jugular catheter. Furosemide was given to augment the diuresis. The child was intubated. Seven milligrams of intravenous Vitamin K were administered. Peritoneal dialysis was begun with standard peritoneal dialysis solution, to which albumin had been added. A large bore catheter was percutaneously placed in the femoral vein and hemodialysis was initiated within two hours after admission. The peritoneal contents were drained two hours after the commencement of hemodialysis. An alkaline diuresis was maintained throughout dialysis and thereafter. The ultrafiltration fluid and urine were meticulously replaced. Sodium bicarbonate was administered intermittently.

Upon completion of the six and a half hour hemodialysis, salicylate levels had fallen to tolerable levels and the child was regaining consciousness with near normal respirations, normal color and a normal cardiovascular status. Subsequent continued diuresis and salicylate level follow-up showed constantly falling serum concentrations and further clinical improvement, obviating the need for further dialysis therapy.

Materials and Management

Blood Access

Immediately upon admission to the emergency room, a number 240 polyethylene tube was placed percutaneously into the external jugular vein and directed to the superior vena cava. This was to be the initial route for fluid and bicarbonate administration as well as central venous pressure measurement. Subsequently it was used as a return line for hemodialysis. A standard adult sized Shaldon catheter was placed in the femoral vein by Seldinger technique and directed to the inferior vena cava. Localization was documented by Xray of radioopaque dye injection (Figure 1).

Intravenous Fluid and Bicarbonate Administration

Initially 500 cc of intravenous D_5W and one-third normal saline were administered according to central venous pressure and clinical impression of dehydration. Likewise bicarbonate was given

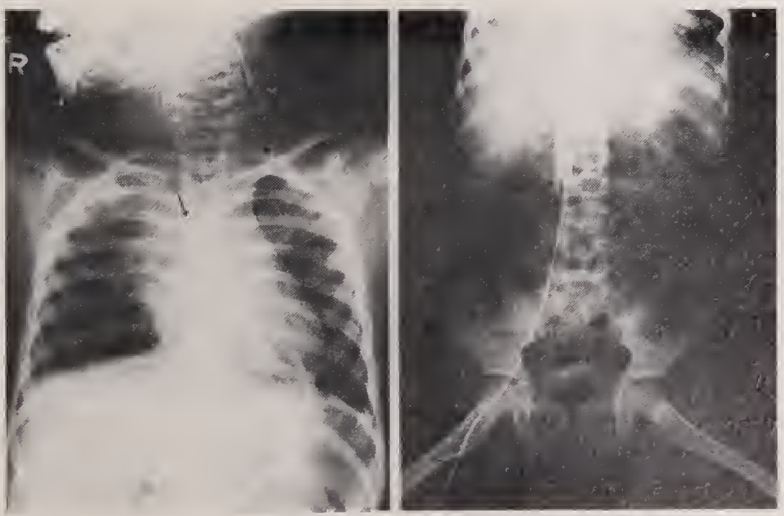

Fig. 1—X-ray dye injection showing location of jugular and femoral catheter.

for reversal of assumed acidosis and subsequently administered according to serial pH determinations to maintain an alkaline urine and blood pH of 7.5 or greater. Further intravenous fluids were given as dictated by weight changes during dialysis and measured diuresis thereafter. Seven mg of Vitamin K were given intravenously.

Peritoneal Dialysis and Protein Binding of Salicylate

One thousand cc of peritoneal dialysate with 1.5 percent dextrose, 5 mEq/liter potassium, and 50 gr of albumin were instilled into the peritoneum through a number 15 gauge needle. Later an adult peritoneal catheter was directed to the left posterior upper quadrant. The peritoneal contents were drained two hours after instillation during early hemodialysis. Drainage fluid in excess of the peritoneal instillation was replaced through the hemodialysis lines.

Pediatric Hemodialysis

A five layer mini-D pediatric dialyzer* with pediatric lines provided the dialysis circuit with a total blood volume of 85cc. [Alternately the Gambro 17 Micron Mini Minor Dialyzer† (blood vol 25cc) and neonates' blood lines* (15cc) may be used in these small children]. The Shaldon catheter in the right femoral vein and directed to the inferior vena cava provided blood supply to the dialyzer while the relatively highly resistant number 240 polyethylene tube at the jugular superior vena cava site was the return line. Blood flow was regulated at 68 ml per minute (BUN clearance—58 ml/minute) during the first two hours of dialysis, and 85 ml per minute (BUN clearance—67 ml/minute) thereafter. A blood pump was used and heparinization was affected by regional infusion technique[8] without protamine neutralization. Thus systemic heparinization did not occur in the patient. The dialysate bath was augmented with potassium chloride to produce a potassium concentration of 5.2 mEq/l. Voluminous ultrafiltration (up to 400 cc per hour) produced by the highly resistant return line was replaced according to minute weight, pulse, blood pressure and central venous pressure measurement variations.

Monitors

Besides central venous pressure, blood pressure and cardiac monitors; the constantly varying weight was measured with a load cell dial read out indicator system on a pediatric bed scale.‡ Line drag inaccuracies were avoided through the use of a scale platform with double tape method. The weighing technique has already been reported.[9]

Results

Serum salicylate levels fell from 96 to 74 mg percent during the first two hours, representing the effect of peritoneal dialysis and albumin instillation as well as the early alkaline diuresis. During the subsequent six and a half hours of hemodialysis (and concomitant alkaline diuresis) salicylate levels fell from 74 mg percent to 29 mg percent. Forced diuresis alone further lowered the salicylate level to 24 mg percent over the next six hours and 16 hours after discontinuing hemodialysis, the salicylate levels had fallen to two mg percent. During the 24 hours of therapy, the patient gradually regained normal consciousness. No rebound elevation in salicylate levels was documented and no further therapy required. Specific laboratory results are tabulated in Figure 2.

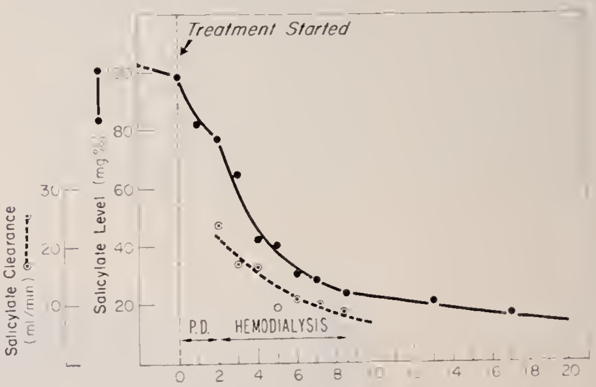

Fig. 2—Salicylate levels and clearances during aggressive therapy of salicylism.

Discussion

This case is presented to demonstrate the combined and aggressive approach to those patients who have extremely severe salicylate toxicity. The patient represents one of the most severe cases of salicylate toxicity ever reported, since the serum level measured at 96 mg% some 24 hours after ingestion represents an initial serum level in excess of 200 mg%.

The specific effects of salicylates include: local

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*Cobe Laboratories, Denver, Colorado.
†Gambro, Lund, Sweden.
‡Potter Bed Scale, Potter Inc., West Hartford, Connecticut.

gastrointestinal irritation; a super sensitization of the respiratory center to carbon dioxide and pH changes; increased metabolic rate; interference with carbohydrate metabolism and a specific antagonism to Vitamin K metabolism as well as to platelet adhesiveness. Furthermore, there may be a direct renal toxic effect.

The aforementioned pathological characteristics have a specific cause and effect relationship to the clinical symptomotology. The gastric irritation may cause nausea, while the Vitamin K and platelet antagonism may promote bleeding (not only in the gastrointestinal tract, but also in other parts of the body such as the brain). The inappropriate response of the respiratory center to carbon dioxide and pH changes usually stimulates hyperpnea and a resultant respiratory alkalosis which in turn adversely affects the neurological status. Hyperglycemia results from the disturbance in carbohydrate metabolism and contributes to a diuresis. Potassium is excreted in favor of retaining hydrogen ions to combat the respiratory alkalosis initially; however, eventually excess potassium losses result in hypokalemia and a functional paradoxic aciduria in the face of alkalemia. The specific effects on carbohydrate metabolism include: (1) uncoupling of oxidative phosphorylation, (2) inhibition of the enzymes in the tricarboxylic acid cycle, (3) diminished aerobic glycolysis resulting in elevated lactate and pyruvate levels, (4) increased glycogenolysis and decreased glycogenesis, (5) mobilization of fat stores with the production of ketosis and (6) a tendency toward hyperglycemia.

The diagnosis may be made by observance of clinical symptomotology and specific tests for serum salicylate levels. Alternately the presence of salicylate may be confirmed by urine testing with 10% ferric chloride with a resultant purple color after heating indicating a positive test. False positives for acetone may be avoided by boiling the urine first. False negatives produced by excessive phosphate are overcome by the addition of extra reagent ferric chloride. It is generally accepted that salicylate levels above 30 mg% should be considered serious; however, the physician must take into account the time interval between ingestion and presentation of the patient. Salicylates appear to be 40-60% protein bound[5] and a large percentage is absorbed in the tissue so that levels only moderately above 30 mg% may represent fairly severe poisoning and a marked metabolic disturbance may be present if the time interval between the ingestion and sampling is significant. For instance a 37 mg% serum level measured some 24 hours after ingestion represents a previous serum level of 70 mg%. In our case, the serum salicylate level of 96 mg% sampled 24 hours post ingestion represented one of the most severe salicylate poisonings ever reported since extrapolation to previous levels would indicate salicylate concentrations of 200 mg% at a sampling time nearer the time of ingestion.

General therapeutic maneuvers include: (1) support of vital signs, (2) prevention of further gastrointestinal absorption, (3) correction of fluid and acid base imbalance and (4) the initiation of an alkaline diuresis. More aggressive measures include: (1) intraperitoneal injection of albumin to induce competitive protein binding of salicylate, (2) peritoneal dialysis and (3) hemodialysis.

Specific therapy includes the administration of syrup of ipecac (20 ml) with 30 grams of activated charcoal when ingestion has been relatively recent. Alternately gastric lavage may be employed, but is complicated by occasional aspiration. These maneuvers may be effective in the milder cases where ingestion has been recent, and in these instances usually serve to prevent further gastric absorption.

The patients with very severe poisoning who present later after ingestion usually have severe metabolic disturbances resulting in coma or semicoma. They must be treated much more aggressively. A nasotracheal tube should be placed and a large bore central venous catheter should be directed to the vena cava (in our case a jugular catheter was directed to the superior vena cava). This central line will serve as a mainline for measurement of central venous pressure and for the administration of fluids and electrolytes as well as for the return line if hemodialysis is elected later.

Adequate intravenous fluid should be administered to reverse any dehydration and enough sodium bicarbonate should be added to produce a serum pH of 7.5 and an alkaline urine. The usual fluid requirements will be 4,000 cc per meter squared per 24 hours. The solution should be one-third normal saline containing 30-40 mEqs of potassium chloride (potassium chloride is important as it will promote the maintenance of an alkaline urine and prevent the development of a paradoxic aciduria). The intravenous bicarbonate should be administered at a rate of two mEq per kg over the first hour and four mEq per kg over the next eight to 10 hours with increasing doses of bicarbonate being added as determined by frequent blood gases and urine pH's. The alkaline diuresis is further stimulated by the intravenous injection of ½ mg per kg of furosemide. Great pain is taken to maintain the alkaline state in the blood and urine, as alkalinity promotes the suspension of salicylate in the ionic form while acidity promotes the nonionic state. The maintenance of the ionic form is important as the salicylate anion is efficiently excreted while the nonionic salicylate is readily reabsorbed by the tubule and therefore not eliminated. Since salicylate is 80% excreted in the urine and only 20% metabolized, promotion of an alkaline urine becomes very significant.

Salicylate removal may also be accomplished through the intraperitoneal injection of albumin. The albumin competes with the patient's protein binding capacity for salicylate (salicylate is 40-60% protein bound in the intoxicated patient). Five grams of albumin per kg of body weight injected into the peritoneal cavity, removed, and reinjected two or three times at one to two hourly intervals is capable of removing nearly 20% of the circulating salicylate.[2,5]

Although peritoneal dialysis in itself is relatively inefficient in the removal of salicylates, it is usually convenient to inject 50 ml per kg of peritoneal dialysate solution containing five mEq per liter of potassium chloride. It will serve as a good vehicle for protein distribution and does contribute somewhat to salicylate removal as well as to the maintenance of an elevated serum potassium. The peritoneal dialysate should be exchanged in one to two hour cycles as this provides the most efficient removal.[4]

Lastly, hemodialysis may be employed. It is by far the most efficient method of salicylate removal and should be applied only in those cases of relatively severe salicylism. The apparatus does take some time to prepare and adequate blood access is occasionally difficult to obtain; however, while these more time consuming tasks are undertaken, the patient may be treated by the previously described regimen. Oftentimes a significant portion of salicylate will have been removed by the therapy already initiated and no treatment time will have been lost during the preparation period in the dialysis unit.

After the patient begins hemodialysis, further peritoneal instillations are not necessary; however, it is reasonable to continue the alkaline diuresis in order to augment the hemodialytic removal. Proper replacement of fluids and frequent blood pH sampling may be accomplished without difficulty through attachments to the hemodialyzers blood lines. Furthermore, the continued alkaline diuresis after hemodialysis will serve to maintain salicylate removal and avoid rebound serum elevations in salicylate when hemodialysis is discontinued.

Summary

Experience with one of the highest salicylate levels ever reported (96 mg% 24 hours post ingestion) in a 22 kg child exemplifies a practical, aggressive approach to therapy.

We combined previous segmental approaches to salicylism, resulting in an efficient regimen for therapy of small children with severe salicylate toxicity. The severely toxic children are generally in major clinical distress. The long time between ingestion and presentation usually precludes early administration of emetics or activated charcoal; however, after the child is intubated, charcoal administration may be helpful. Administration of Vitamin K tends to counteract the salicylate's antagonism to Vitamin K metabolism. Initial alkaline diuresis is important, but equally important is the early peritoneal instillation of dialysate—albumin solution to further remove and avidly bind the salicylate to protein within the peritoneum while hemodialysis is arranged. The protein binding of salicylate within the peritoneal cavity competes with that which occurs in the blood and thus promotes a greater flux of salicylate into the peritoneum for binding on the unbound sites of the administered albumin.

A large bore jugular central venous line is immediately placed and sodium bicarbonate administered with lasix to produce an alkaline diuresis. Directly thereafter, 50 cc per kg of peritoneal dialysate with five gr per kg albumin and five mEq per liter potassium are instilled into the abdominal cavity. The hemodialysis unit is

notified and a second large bore catheter is percutaneously placed in the femoral vein for dialyzer blood supply while the jugular line serves as the blood return port. The peritoneal instillation of protein dialysate and the alkaline diuresis provide immediate and efficient salicylate removal while hemodialysis is begun. The protein binding of salicylate by albumin within the abdominal cavity appears to play a major role. Approximately two hours later, while hemodialysis continues, the peritoneal contents are drained and the cycle begun again (only if blood levels indicate the need). Otherwise, the alkaline diuresis continues to augment salicylate removal during and after dialysis. The post dialysis alkaline diuretic effect prevents rebound elevation of serum salicylate and obviates the need for further dialytic therapy.

References

1. Buselmeier TJ, Santiago EA, Simmons RL, Najarian JS, Kjellstrand CM: Arteriovenous shunts for pediatric hemodialysis. Surgery 70:638, October 1971.
2. Buselmeier TJ, Mauer SM, Simmons RL, Najarian JS, Kjellstrand CM: Salicylate intoxication—current topics in critical care. Medicine 3:64, 1974.
3. Elliot GB, Crichton JU, Miller GE: Peritoneal dialysis in salicylate poisoning. Aneth Analg (Cleveland) 42:338, 1963.
4. Etteldorf JN, Dobbins WT, Summitt RL, Rainwater WT, Fisher RL: Intermittent peritoneal dialysis using 5% albumin in the treatment of salicylate intoxication in children. J Pediatrics 58:225, 1961.
5. Etteldorf JN, Montalvo JM et al.: Intermittent peritoneal dialysis in the treatment of experimental salicylate intoxication. J Ped 56:1, Jan, 1960.
6. Farrell PC, Grib NL, Fry DL et al.: A comparison of in vitro and in vivo solute-protein binding interactions for normal and uremic subjects. Transaction of ASAIO 18:268, 1972.
7. Fine RN, Stules Q, DePalma JD, Donnell GN: Hemodialysis in infants under one year of age for acute poisoning. Am J Dis Child. 116:657, Dec, 1968.
8. Kallen RJ, Zaltzman S, Coe FL, Metcoff J: Hemodialysis in children technique, kinetic aspects related to varying body size and application to salicylate intoxication, acute renal failure and some other disorders. Medicine (Balt.), 45:1, 1966.
9. Kjellstrand CM, Buselmeier TJ: A simple method for anticoagulation during pre-and postoperative hemodialysis, avoiding rebound phenomenon. Surgery 72:630, 1972.
10. Kjellstrand CM, Mauer SM, Shideman JR, Buselmeier TJ: Accurate weight monitoring during pediatric hemodialysis. Nephron 10:238, 1973.
11. Kjellstrand CM, Santiago EA, Buselmeier TJ: Development of a special pediatric shunt. Proceedings of the EDTA 8:505, 1971.
12. Kjellstrand CM, Shideman JR, Santiago EA, Mauer SM, Simmons RL, Buselmeier TJ: Technical advances in hemodialysis of very small pediatric patients. ASAIO Proc. Dialysis & Transplant Forum 1:124, 1971.
13. Maher JF: Hemodialysis and peritoneal dialysis: a review of their use in renal insufficiency and acute poisoning. Ohio Med J 60:235, 1964.
14. Mauer SM, Shideman JR, Buselmeier TJ, Kjellstrand CM: Long term hemodialysis in the neonatal period. Am J Dis Child 125:269, 1973.
15. Najarian JS, Simmons RL, Tallent MB, Kjellstrand CM, Buselmeier TJ, Vernier RL, Michael AF: Renal transplantation in infants and children. Ann Surgery 1974:583, Oct, 1971.
16. Piera AW: Salicylate intoxication. Postgraduate Med 48:243, Sept 1970.
17. Scherz RG: Prevention of childhood aspirin poisoning. New Engl J Med 285:1361, 1971.
18. Schreiner GE, Breudan PT: Dialysis of Poisons and drugs—annual review. ASAIO 18:575, 1972.
19. Shideman JR, Meyer RM, Buselmeier TJ, Mauer SM, Kjellstrand CM: Hemodialysis of very small pediatric patients. Dialysis and Transplantation No. 41:25, 1972.
20. Thomsen AC, Dalgard OZ: Hemodialysis in acute acetylosalicilic acid poisoning, Amer J Med 25:484, 1958.

Clinical Note

A Rapid Shakedown

My office is plagued over the weekend, when the air conditioning is turned off, with temperatures over 100°F. This results in all clinical thermometers reading over 100°F. I have discovered a simple way to shake down these thermometers as follows: We fill our office centrifuge with these high reading thermometers and turn the machine on for about 10 seconds. We can shake down a dozen or so thermometers in as many seconds.

Reuben Berman, M.D.
Editor Emeritus

Thyrotoxicosis, Pernicious Anemia, Hypertension and Primary Hyperparathyroidism

RONALD OLIN, M.D.*

A number of disease inter-relationships are discussed in a patient who developed a combination of endocrinopathies, pernicious anemia and hypertension.

THIS REPORT describes a patient who, over a 30-year period, developed the unusual combination and sequence of diseases outlined in the title. Pernicious anemia has had a long associaton with endocrine diseases of the deficiency type. In this case, it was associated first with thyrotoxicosis and then primary hyperparathyroidism. The case and discussion will also briefly review the association of primary hyperparathyroidism with hypertension, thiazide-induced hyperparathyroidism, the asymptomatic case of hyperparathyroidism with the indications for surgery and the coexistence of thyrotoxicosis with primary hyperparathyroidism.

Case Report

A 72-year-old Caucasian female was seen on November 27, 1973, for a general examination. There was no family history of pernicious anemia, endocrine diseases, peptic ulcer, renal stones or hypertension. On October 22, 1943, (age 41) she was evaluated for the complaints of nervousness, palpitation, heat intolerance and weight loss of 10 lbs. since the early summer when shocked by a sudden death in the family. On examination, her weight was 137½ lbs., blood pressure 160/90, and resting pulse 120; other positive findings included prominent eyes with a stare, a small symmetrical goiter, sweaty palms and a fine hand tremor. Laboratory studies revealed a hemoglobin of 11.8 gm.% leukocyte count 11,900 per cmm., sedimentation rate of eight mm/hr. and normal urinalysis. Chest Xray was negative. A ECG showed a sinus tachycardia. The basal metabolic rate was +31.8. She was advised to rest and given a prescription for Lugol's solution 10 drops daily. On November 5 her weight was up three lbs., and the BMR was now +21.1. Phenobarbital 30 mg. three times daily was added to the program. On November 15, through a "Kocher" neck incision, a bilateral subtotal thyroidectomy was performed. The tissue diagnosis was "toxic hyperplastic goiter." At the last follow-up on September 8, 1944, she felt well. Her weight was 152 lbs., blood pressure 130/70, pulse 78 per minute and there were no signs of thyroid toxicity. She did not see a physician and felt well for the next 28 years.

On November 23, 1971 (age 69), she was admitted to a hospital because of having fainted and sustained a small laceration of the scalp. She had been very weak and pale for two months with anorexia and weight loss from 130 to 87 lbs. over the previous two to three years. On examination, her weight was 87 lbs., blood pressure 126/80 and pulse 110: other findings included extreme paleness, a red atrophic tongue, normal jugular venous pressure, lungs clear, tachycardia with a gallop sound, 2+ bilateral pitting edema to the knees absent position and vibration senses at the ankles and generally hypoactive reflexes. Laboratory tests revealed a hemoglobin of 4.7 gm.%, hematocrit 14 vols.%, leukocyte count 3,000 per cmm. with a normal differential, platelet count 74,000 per cmm. and reticulocyte count 1.5%. Blood smear showed macrocytosis, hypersegmented neutrophils, and severe aniso and poikilocytosis. A panel of 12 chemistries including serum calcium was normal except for a total protein of 4.85 gm% and serum bilirubin 1.1 mg.%. Chest Xray showed a prominent left ventricle. A 12-lead ECG showed a complete left bundle branch block. There was a histamine-fast achlorhydria. A Schilling test revealed 2.1% excretion of labelled vitamin B12 before intrinsic factor in a 24-hour urine collection. Treatment was started with intramuscular vitamin B12 injections. On November 29 the hemoglobin was 7 gm.% with a reticulocyte count of 36%. Therapy was continued as an outpatient with monthly injections of 1000 mcg. of vitamin B12. On April 5, 1972, she felt well. Her weight was 113 lbs., blood pressure 190/95, pulse 100 per minute and the hemoglobin 12.8 gm.%

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See editorial, page 487.

From December 11, 1972, to April 6, 1973 her blood pressure was followed and averaged 180-190/100-105. On April 6, it was felt she had sustained, essential hypertension, uncomplicated by cardiac or renal impairment and Aldactazide® one tablet daily was started. On June 6, the blood pressure was 150/95.

On November 27, 1973, an annual general examination was done. She felt well and had no complaints; medications were Aldactazide® one tablet daily and vitamin B12 1000 mcg. intramuscularly monthly. On examination her weight was 135 lbs., blood pressure 160/95 and was otherwise not remarkable. An auto-analyzer panel of 12 chemistries revealed a serum calcium of 11.6 mg.% (our normal 8.6-10.6 mg.%). She was taking no vitamins or using excess milk or alkali. Repeat serum calciums were 11.0 and 11.4 mg.% and serum phosphorus 1.54 and 2.1 mg.% (our normal 3.0-4.5 mg.%). The serum cholesterol was 303 mg.% and potassium 3.4 mEq/1. Urinalysis revealed pyuria, grade I but cultures were negative. The following blood tests were normal: hemoglobin, leukocyte count, sed. rate, transaminases, blood sugar, blood urea nitrogen, alkaline phosphatase, bilirubin, sodium, uric acid, potassium, and creatinine, serum protein electrophoresis, serum total thyroxin and T3 resin index. A 24 hour urine collection for calcium was 345 mg. (our normal 50-400 mg.). Roentgenograms of the chest, hands, kidneys, skull, esophagus, stomach and duodenum were not remarkable. A 12-lead ECG again showed a complete left bundle branch block.

A blood specimen analyzed at the Mayo Clinic Laboratory showed a serum radio-immunoassay of parathormone of 54 μl Eq/ml. at 10 A.M. (normal 0-40), serum calcium 12.3 mg.% (normal 8.9-10.2 mg.%), serum phosphorus 2.5 mg.% and magnesium 191 mg.%.

On November 29, she was advised to discontinue Aldactazide® and on December 21, the blood pressure was 170-180/100-105, serum calcium 11.9 mg.% and phosphorus 2.1 mg.%. Aldactazide®, once daily, was resumed.

Because of the average serum calcium over 11 mg.%, the uncertainly of future follow-up and the possibility of parathyroid malignancy, neck exploration was advised and performed on February 12, 1974. Deep along the esophagus below the right inferior pole of the thyroid remnant, a 2.5 cm. in diameter parathyroid adenoma on a very distinct vascular pedicle was identified and removed. It weighed 1 gram and was histologically a chief-cell adenoma. Serum calcium and parathormone returned to normal post-operatively.

Discussion

The statistical pitfalls of the association of diseases are obvious and do not necessarily mean causal association. The evidence for the association between pernicious anemia and Addison's disease,[1] hypothyroidism,[2] diabetes mellitus,[3] thyrotoxicosis, Hashimoto's thyroiditis[4] and hypoparathyroidism[5] is nevertheless very convincing.

In contrast to the combination pernicious anemia-hypothyroidism, the combination pernicious anemia-thyrotoxicosis is uncommon. Boenheim et al.[6] in 1945 reviewed 75 cases of the combination pernicious anemia—thyrotoxicosis and felt that the association was due to chance. In seven cases, the two diseases occurred simultaneously; in 10 cases the pernicious anemia preceded the thyrotoxicosis and in the remaining cases, thyrotoxicosis preceded pernicious anemia. In the largest reported series, Wilkinson in 1949[7] had 33 cases of thyrotoxicosis in 1600 patients with pernicious anemia, which was a higher ratio than in hospital admissions as a whole. Of 256 patients in a hematology clinic with pernicious anemia seen by McNichol in 1961,[8] 13 (11 females and two males) had at one time or another thyrotoxicosis usually coming on after the onset of the pernicious anemia; this incidence was 5.1%. In a similar control population, only two had thyrotoxicosis, a significant difference.

The association is equally striking when looked at from the other direction. Tudhope and Wilson in 1960[9] had nine cases of pernicious anemia in a series of 760 cases of thyrotoxicosis, an incidence of 1.2% whereas the incidence of pernicious anemia among 12,639 patients of a similar age group was 0.35%. Thyrotoxicosis usually precedes pernicious anemia but the reverse sequence occurs sufficiently often to indicate that it is unlikely that one disease causes the other. Indeed, of McNichol's 13 cases, 10 developed thyrotoxicosis on an average of 3.3 years (range 21 mos.-nine yrs.) after the diagnosis of pernicious anemia, in two cases the diseases occurred simultaneously and in one case pernicious anemia developed two years after the treatment of thyrotoxicosis.

Considerable evidence suggests a relationship between serum calcium and blood pressure.[10] Some investigators believe that the hypertension in some cases of primary hyperparathyroidism is secondary to hypercalcemia and, therefore, can be reduced or reversed by lowering serum calcium. Madhaven et al. in 1970[11] reported that in 80 patients in whom primary hyperparathyroidism was corrected surgically, 14 (17.5%) were hypertensive preoperatively. Twelve of the 14 patients were females, their average age was 52 (range 37-84 yrs.). Six of the 14 hypertensive patients had no functional or radiographic evidence of renal impairment. Postoperatively, hypertension was significantly reduced in seven of the 14 cases including three of the six patients without and four of the eight patients with renal impairment. Other authors, as will be noted, did not find any improvement in hypertension postoperatively.

The results of animal experiments[12] in which hypercalcemia, hypophosphatemia and parathyroid hypertrophy with histologic changes were noted, lends considerable support to the hypothesis that in some patients,[13] prolonged thiazide-diuretic therapy stimulates the parathyroid glands although the exact mechanism is obscure. These patients are asymptomatic and without complications such as renal stones, bone resorption or peptic ulceration. The effect of thiazides on the parathyroid glands appears related to reduction in urine calcium excretion in normals and in patients with various disorders of calcium and bone metabolism. This effect has been used to prevent renal stones in patients with idiopathic hypercalcuria. Therefore, serum calcium and phosphorus levels should be determined before and after therapy with thiazides in patients with hypertension. If serum calcium remains elevated after discontinuing thiazides for one to two months, neck exploration for parathyroid disease should be considered.

Paloyan et al., in 1969[14] noted that in 30 patients with primary hyperparathyroidism, six presented with the problem of essential hypertension. Of these six patients, four were males and two females, ranging in age from 43-61 years. The hypertension had been present five to 40 years and was associated with continuous two to eight year intake of thiazides. All six patients were studied on a metabolic ward seven days after stopping thiazides with serial serum calciums, phosphorus, BUN, urea clearance, urinary calcium, IVP, skeletal survey and bone densinometry. Although all six patients had hypercalcemia and low serum phosphorus, none had bone or renal involvement or peptic ulcers. At surgery, four of the six patients had a single parathyroid adenoma and two had hyperplastic parathyroids. No change in blood pressure was noted postoperatively and thiazides were resumed in all six, two requiring a lower dose. Serum calcium returned to normal in all six patients postoperatively and remained so 18-36 months despite restarting thiazides. Therefore, hypertension was not eliminated in these six patients and appeared to be the primary problem with the hyperparathyroidism probably secondary to the administration of thiazides used in the treatment of the hypertension.

Primary hyperparathyroidism is twice as common in females as males and tends to occur at an earlier age in males. Randall and Keating[15] have stressed the role of serendipity in the diagnosis and to this must be added the cases picked up by autoanalyzer biochemical screening. Purnell et al. in 1971[16] reviewed their experience with the first 30 months of a long-term prospective study of 401 patients admitted to a parathyroid clinic with increased serum calcium levels. Parathyroid exploration was carried out in 191 with serum calcium over 11 mg.% or with bony, renal or G.I. complications; 171 showed parathyroid disease. One hundred and forty-seven (147) patients remained in the group called provisional hyperparathyroidism who had serum calciums below 11 mg.% or no evidence of renal or bone disease. It was noted that only 15% of this latter group ever acquired any metabolic indication of active hyperparathyroidism (serum calcium over 11 mg.% or systemic symptoms) over the next three years. So watchful expectancy is the treatment of choice in this group of provisional, asymptomatic or chemical hyperparathyroidism.

Keating has outlined six criteria for surgical intervention in primary hyperparathyroidism; these are: (1) mean serum calcium over 11 mg.%, (2) Xray evidence of bone disease, (3) impaired renal function, (4) metabolically active or infected renal stones, (5) prolonged observation of the patient impractical and (6) gastrointestinal complications (peptic ulcer not controlled medically or recurrent pancreatitis).

A radio-immunoassay of parathormone has been developed and is most helpful in making the diagnosis.[17] There is circadian variation in both parathormone blood levels and serum calcium. Serum parathormone levels are also proportional to serum calcium and parathyroid tumor weight. The radioimmunoassay for parathormone also distinguishes between the materials from two types of hyperparathyroidism: primary and nonparathyroid cancer (usually lung or kidney) without skeletal metastases.

Estrogens act in postmenopausal osteoporosis by inhibiting parathormone-mediated bone resorption. Gallagher et al. in 1972,[18] in a study of ten such women noted that they provided a good alternative to surgery in the postmenopausal woman with primary hyperparathyroidism. Their work has not been confirmed.

Thyrotoxicosis may coexist with primary hyperparathyroidism.[19,20] Bortz et al. in 1961[19] noted that the literature contained 19 cases of thyrotoxicosis associated with hypercalcemia and added seven cases of their own. In all 26 patients, the serum calcium returned to normal after treatment of the thyrotoxicosis. They reported on 27 cases of untreated thyrotoxicosis in which the tubular reabsorption of phosphate (TRP) was normal or high in 24. Nine patients had associated hypercalcemia with three having a low TRP. In two of these three patients with an extremely low TRP (51% and 50%), parathyroid adenomas were removed. The third patient had a borderline TRP of 76% and after treatment of the thyrotoxicosis, both the serum calcium and TRP returned to normal. The radio-immunoassay of parathormone will help in the diagnosis when these two diseases co-exist.

Summary

A patient developed pernicious anemia 28 years after the surgical treatment for Grave's disease. About one and a half years after the diagnosis of pernicious anemia, sustained hypertension was noted and treated with a drug containing a small amount of thiazide-diuretic. Eight months later, the serum calcium was found to be elevated by auto-analyzer biochemical screening and a diagnosis of primary hyperparathyroidism was eventually established. When the thiazide-containing drug was discontinued for one month, serum calcium remained elevated and surgical exploration was carried out. A parathyroid adenoma was removed and the serum calcium and parathormone returned to normal values. The inter-relationship of the combination and sequence of diseases are discussed.

References

1. Berlin R: Addison's disease: Familial incidence and occurrence in association with pernicious anemia. Acta Med Scand 144:1, 1952.
2. Tudhope GR Wilson GM: Deficiency of vitamin B12 in hypothyroidism. Lancet 1:676, 1963.
3. Wilkinson JF: Diabetes mellitus & pernicious anemia. Brit Med J 1:676, 1963.
4. Bastenie PA & Neve P: Pernicious anemia, chronic thyroiditis & antithyroglobulin antibodies. Lancet 1:1110, 1963.
5. Morse WI, Cochrane WA & Landrigan PL: Familial hypoparathyroidism & adrenocortical insufficiency: a variant of mucoviscidosis. New Engl J Med 264:1021, 1961.
6. Boenheim F, Schwimmer D & McGavack TH: The combination of hyperthyroidism & pernicious anemia: report of a case with a review of the literature. Ann Int Med 23:869, 1945.
7. Wilkinson JF: Megaloblastic anemias. Lancet 1:249, 1949.
8. McNichol GP: Thyrotoxicosis associated with pernicious anemia. Am J Med Sci 241:336, 1961.
9. Tudhope GR & Wilson GM: Anemia in hyperthyroidism. Quart J Med 29:513, 1960.
10. Earll JM, Kurtzman NA & Moser RH: Hypercalcemia and hypertension. Ann Int Med 64:378, 1966.
11. Madhaven T, Frame B and Block MA: Influence of surgical correction of primary hyperparathyroidism on associated hypertension. Arch Surg 100:212, 1970.
12. Pickleman JR et al.: Thiazide-induced parathyroid stimulation. Clin Res 16:468, 1968.
13. Stote RM et al.: Hydrochlorthiazide effects on serum calcium and immunoreactive parathormone concentration. Ann Int Med 77:587, 1972.
14. Paloyan E, Forland M and Pickleman JR: Hyperparathyroidism coexisting with hypertension and prolonged thiazide administration. JAMA 210:1243, 1969.
15. Randall RV and Keating FR Jr: Serendipity in the diagnosis of primary hyperparathyroidism. Am J Med Sci 236:575, 1958.
16. Purnell DC, Smith LH, Scholz DA, Elveback LR & Arnaud CD: Primary hyperparathyroidism: Prospective clinical study. Am J Med 50:670, 1971.
17. Oldham SB, Fischer JA, Capen CC, Sizemore GW & Arnaud CD: Dynamics or parathyroid hormone secretion in vitro. Am J Med 50:650, 1971.
18. Gallagher JC and Nordin BEC: Treatment with estrogens of primary hyperparathyroidism in postmenopausal women. Lancet 1:503, 1972.
19. Bortz W, Eisenberg E, Bowers CY and Pont M: Differentiation between thyroid and parathyroid causes of hypercalcemia. Ann Int Med 54:610, 1961.
20. Jackson CE, Webster JS, Talbert PC and Caylor HD: Concomitant hyperparathyroidism as a cause of the hypercalcemia associated with hyperthyrodism, Am Int Med 54:992, 1961.

Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

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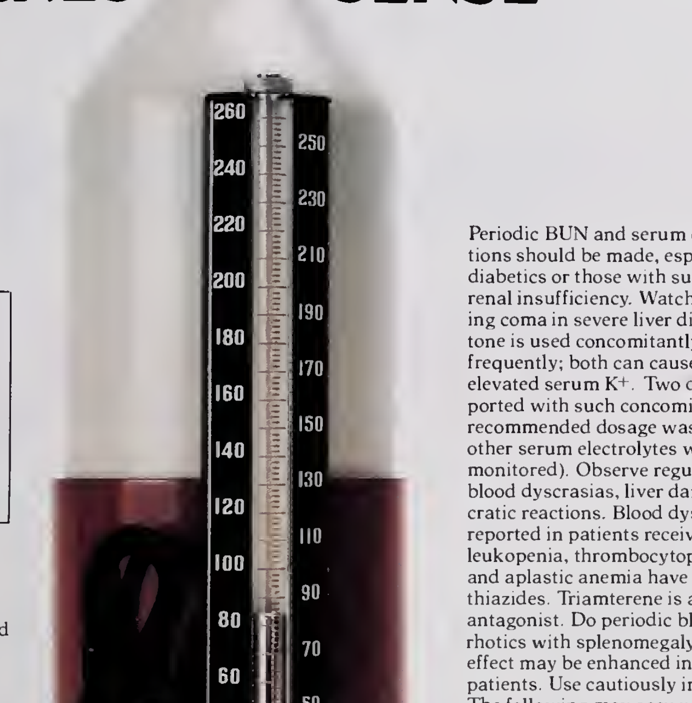

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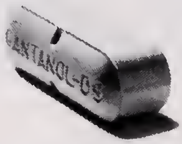

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lications: Acute, recurrent or chronic urinary tract infec- ns (primarily pyelonephritis, pyelitis and cystitis) due to sceptible organisms (usually *E. coli, Klebsiella-Aerobacter,* phylococcus, *Proteus mirabilis* and, less frequently, teus vulgaris), in the absence of obstructive uropathy or eign bodies. Note: Carefully coordinate *in vitro* sul- amide sensitivity tests with bacteriologic and clinical sponse; add aminobenzoic acid to follow-up culture dia. The increasing frequency of resistant organisms its the usefulness of antibacterials including sul- amides, especially in chronic or recurrent urinary tract ections. Measure sulfonamide blood levels as variations y occur; 20 mg/100 ml should be maximum total level.

ntraindications: Sulfonamide hypersensitivity; preg- ncy at term and during nursing period; infants less than months of age.

rnings: Safety during pregnancy has not been estab- ned. Sulfonamides should not be used for group A ta-hemolytic streptococcal infections and will not eradi- e or prevent sequelae (rheumatic fever, glomerulone- ritis) of such infections. Deaths from hypersensitivity reac- ns, agranulocytosis, aplastic anemia and other blood scrasias have been reported and early clinical signs re throat, fever, pallor, purpura or jaundice) may indi- e serious blood disorders. Frequent CBC and urinalysis h microscopic examination are recommended during fonamide therapy. Insufficient data on children under with chronic renal disease.

ecautions: Use cautiously in patients with impaired renal hepatic function, severe allergy, bronchial asthma; in glu- se-6-phosphate dehydrogenase-deficient individuals in om dose-related hemolysis may occur. Maintain ade- ate fluid intake to prevent crystalluria and stone formation.

verse Reactions: *Blood dyscrasias* (agranulocytosis, lastic anemia, thrombocytopenia, leukopenia, hemolytic emia, purpura, hypoprothrombinemia and methemo- binemia); *allergic reactions* (erythema multiforme, skin iptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis); *gastrointestinal reactions* (nausea, emesis, abdominal pains, hepatitis, diarrhea, anorexia, pancreatitis and stomatitis); *CNS reactions* (headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo and insomnia); *miscellaneous reactions* (drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L.E. phenomenon). Due to certain chemical similarities with some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia as well as thyroid malignancies in rats following long-term administration. Cross-sensitivity with these agents may exist.

Dosage: Systemic sulfonamides are contraindicated in infants under 2 months of age (except adjunctively with pyrimethamine in congenital toxoplasmosis). *Usual adult dosage:* 2 Gm (2 DS tabs or 4 tabs or 4 teasp.) initially, then 1 Gm *b.i.d.* or *t.i.d.* depending on severity of infection.

Usual child's dosage: 0.5 Gm (1 tab or teasp.)/20 lbs of body weight initially; then 0.25 Gm/20 lbs *b.i.d.* Maximum dose should not exceed 75 mg/kg/24 hrs.

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Editorials

Thyrotoxicosis, Pernicious Anemia, Hypertension and Primary Hyperparathyroidism

Do thiazide diuretics produce hyperparathyroidism in man? In this issue Olin describes a patient with multiple diseases in whom hyperparathyroidism was diagnosed following treatment of hypertension with a thiazide. On the basis of his experience with this patient and the report by Paloyan et al. (his reference 14) of other patients with the same sequence of events Olin* concludes that "hypertension . . . appeared to be the primary problem with the hyperparathyroidism probably secondary to the administration of thiazides used in the treatment of the hypertension."

For many years it has been known that benzothiadiazine diuretics alter calcium metabolism. Their ability to produce hypocalciuria has been used to treat calcium nephrolithiasis. They appear to increase renal tubular reabsorption of calcium, probably by potentiating the effect of parathyroid hormone on the kidney. In addition, the thiazides can produce hypercalcemia. The hypercalcemia does not appear to be secondary to the increased renal tubular reabsorption of calcium, for it has been described even in patients on chronic dialysis with little or no remaining kidney function.[1]

As Olin notes Pickleman et al. produced hypercalcemia and parathyroid hyperplasia in dogs by the prolonged administration of a thiazide.[2] This does not prove the same occurs in man. Olin is in error when he refers to the work of Stote, Smith et al. (his reference 13) to document the hypothesis that "in some patients, prolonged thiazide-diuretic therapy stimulates the parathyroid glands . . ." Stote et al. showed that the administration of hydrochlorothiazide, 50 mg twice daily, produced hypercalcemia but did *not* increase circulating immunoreactive parathyroid hormone. Coe, Canterbury and Reiss found that in patients with idiopathic hypercalciuria thiazide administration *reduced* elevated serum immunoreactive parathyroid hormone concentrations.[3] Brickman et al. could demonstrate no change in plasma parathyroid hormone levels in six patients given thiazides.[4]

The thiazides enhance the release of calcium from bone. In part this is due to a potentiation of the action of parathyroid hormone on bone. There is no proof that the thiazides actually stimulate parathyroid gland activity in man. If they did, hyperparathyroidism would be encountered much more frequently than it is, considering the large number of patients given thiazides in recent years.

Since hypertension frequently is associated with hyperparathyroidism I suspect that in some instances the administration of a thiazide simply unmasks an already present occult or latent hyperparathyroidism.

Donald A. Duncan, M.D.
Minneapolis, Minnesota

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*See page 478.

References

1. Koppel MH, Massry SG, Shinaberger JH, et al.: Thiazide-induced rise in serum calcium and magnesium in patients on maintenance hemodialysis. Ann Intern Med 72:895, 1970.
2. Pickleman JR, Straus FH II, Forland M et al.: Thiazide-induced parathyroid stimulation. Metabolism 18:867, 1969.
3. Coe FL, Canterbury J, Reiss E: Hyperparathyroidism in idiopathic hypercalciuria: primary or secondary? Trans Assoc Am Physicians 84:152, 1971.
4. Brickman AS, Coburn JW et al.: The effect of hydrochlorothiazide administration on serum and urinary calcium in normal, hypoparathyroid and hyperparathyroid subjects: studies on mechanisms. Israel J Med Sci 7:518, 1971.

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Stratified Coronary Care in Minnesota

ISCHEMIC HEART DISEASE continues as our nation's number one killer. In response, the American Heart Association (AHA) in 1971 published their concept of Stratified Coronary Care (SCC) defined as the interrelation of various elements of hospital and prehospital coronary care.[1] Level one of SCC contains: 1. System entry, 2. Mobile life support, 3. Fixed life support units. Level two includes coronary and post coronary care units while level three is regional coronary care.

In recent years these components have expanded independently at various rates. In 1975 the Minnesota affiliate of AHA (AHA, MA) decided to sponsor a conference in SCC in attempts to improve statewide planning at each level.

The purpose of the conference was to bring together representative groups to review the current status of SCC in Minnesota and to begin coordinated planning by reacting to position papers in each category. Cardiac rehabilitation was added because of its emergence as an integral part of SCC. Since planning in modern medicine involves many disciplines, representatives from medicine, nursing, hospital administration, local and state health planning agencies, legislators, department of health, and urban and rural representatives were included in both individual task forces and as invited conference participants. Each position paper was developed by people working in the area assessing current Minnesota status and recommending future activities.

The conference was held on June 10 and 11, 1976. AHA, MA views the conference output as a beginning of a plan for SCC in Minnesota. A subsequent group has been comprised to promulgate the recommendations to interested groups and to stimulate action on individual items by appropriate groups, eg. Minnesota State Medical Association, Minnesota Department of Health, etc.

The next issues of MINNESOTA MEDICINE will include the six position papers presented at the conference. It is hoped that with the broad input, both in position paper development and at the conference, fragmentation in planning can be avoided. The key will be continued discussion between all involved disciplines.

Brian C. Campion, M.D.
President
Chairman, Stratified Coronary Care Committee
American Heart Association, Minnesota Affiliate

References

1. Resources for the optimal care of patients with acute myocardial infarction. Inter Society Commission for Heart Disease Resources. Circulation 43:155, May 1971.

Abortion Technique

SINCE 1970 THERE HAS been an impressive development in abortion technique, particularly in regard to the midtrimester termination. High risk surgical procedures such as hysterotomy, with a documented mortality rate of 270.2/100,000 abortions[1] are no longer required in 1977. While morbidity rates are still three to four times greater in midtrimester abortions as compared to the first trimester, the use of abortifacients such as hypertonic saline, urea, and prostaglandin analogues has greatly reduced mortality and morbidity rates resulting from the second trimester procedure.

As evidence of progress the Center for Disease Control cites the following mortality rates for the abortion procedure in the United States between 1972 and 1974: 0.4 deaths/100,000 abortions at eight weeks or less, to 18/100,000 abortions at 16 to 20 weeks gestation.[2]

Although midtrimester abortion is far safer now than it was seven years ago, there is as yet no simple "best" technique. All methods or combination of methods for midtrimester abortions at the present time require a team of highly skilled physicians and hospital staff. In addition to searching for less complicated and safer techniques, research workers are striving to increase the effectiveness of the procedure by shortening the time interval between the initiation of the procedure and fetal expulsion.

The most commonly used method in the United

States at the present time for terminating midtrimester abortion is the intra-amniotic instillation of hypertonic saline, usually combined with oxytocin administration. Associated medical complications are hemorrhage, infection, uterine injury, hypernatremia, and coagulopathy.

Means of avoidance of the danger of the life-threatening sequelae associated with hypertonic saline is being sought by the use of prostaglandin and its analogues. The prostaglandin group of abortifacients, initially isolated from human seminal plasma, has never induced coagulopathy, and side effects are transitory and rarely serious in character. The only prostaglandin approved by the Food and Drug Administration for clinical use at the present time is prostaglandin $F_{2\alpha}$, which first became available to the clinician in 1973 for intra-amniotic use only. The number of case reports on the use of prostaglandin are as yet few in number.

At St. Paul-Ramsey Hospital since November of 1975, the extraamniotic route of prostaglandin $F_{2\alpha}$ has been employed, supplemented with the insertion of intracervical laminaria and oxytocin administration. The induction-abortion time in approximately 150 cases averaged less than 12 hours and the complication rates were low.[3]

Dr. Horowitz* has documented the safe and successful termination of 200 midtrimester pregnancies by the intra-amniotic administration of prostaglandin $F_{2\alpha}$. While 24% of his patients required reinjection after 24 hours, there were no failures in the entire series. This is a remarkable rate of success, and his infection rate of 1% is very acceptable.

Until better public and physician education eliminates the need, midtrimester abortion services must be available. Dr. Horowitz' pioneer efforts to improve technique in a medically unpopular field should be applauded.

Jane E. Hodgson, M.D.
St. Paul, Minnesota

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*See page 509.

References

1. Berger GS et al.: Obstet Gynec 43:315, 1974.
2. United States Center for Disease Control (CDC). Abortion surveillance—annual summary 1974. Atlanta, Georgia, CDC April 1976. (HEW Publication No. (CDC) 76-8276) 49 p.
3. Hodgson J and Van Gorp P: Midtrimester abortion using continuous extraovular prostaglandin F_2 ($PGF_{2\alpha}$) Fertility & Sterility, 27:12:1359. December 1976.

Cover Painting

"Minnesota October"

Dr. Frances E. Schaar painted the cover presentation while studying with Minneapolis impressionist artist Alma Trulis. She took the photograph of the oil painting with a Nikon f2 so that the editors might publish this beautiful painting on the July issue. While living in Minneapolis, she belonged to three photography clubs: Nature, Women's Color Photo and Doctors' Photo Club.

In 1947 she moved to Minneapolis to join the staff of the University of Minnesota Health Service. She practiced pediatrics for many years with offices in the Southdale Medical Building. In 1973 she joined the staff of the Student Health Service at Northern Illinois University, DeKalb, Illinois.

Treatment of Acute Leukemia 1970—1976

CAN ADULTS WITH acute non-lymphocytic leukemia (ANLL) be treated successfully outside of major leukemia treatment centers? This question is raised by Dr. Robert Green in the May issue* as he reports his experience in treating adult ANLL in community hospitals from 1970 through 1976. Dr. Green's paper is of interest, since many patients are treated in the community without the benefit of contact with major research centers.

In the past three years, significant progress in the treatment of adult ANLL has been reported from the major leukemia research centers. Complete remission rates of 51-82% are regularly being achieved.[1-7] More importantly, as many as 30% of adult responders now survive in continuous complete remission for more than three years (Table). Some of these patients appear to be cured. Green's results contrast sharply with those reported from the major centers. Although his complete remission rate of 42% is only slightly less than that reported from some centers, his average durations of remission and survival are much less. Most significantly, he reports no long-term survivors, although this is currently the goal in treatment of adult ANLL.

The conclusion from comparing the results reported by Dr. Green with those from major research centers appears to be that if patients are to achieve long-term, disease-free survival, and possibly cure, they must be referred to a major center. However, there are a few studies which show satisfactory results can be obtained in community hospitals when there is a cooperative effort with a leukemia research center.[13,14] In such instances, the patients at community hospitals are treated on protocols designed and supervised by the research center. The benefits of such arrangements are that: (1) patients receive the most up-to-date treatment regimens; (2) patients can obtain support facilities from a major treatment center when necessary; (3) patients with poor prognostic factors can be identified early and transferred to the research facility; (4) oncologists in the community have access to newer drugs and the latest developments in leukemia; and (5) larger numbers of patients can be studied and thus we will more rapidly achieve cure for the majority of adults with ANLL.

TABLE
Remission Duration and Survival in Previously Untreated Adults with Acute Non-Lymphocytic Leukemia

Reference Numbers	Duration Complete Remission (CR) Median (mos)	Duration Complete Remission (CR) >36 mos	Median Survival of CR Patients (mos)
1	10	12%	24
3	11	7%	17
9, 10	14	†	25
11	16*	†	†
8	20	8%	24*
12	25	30%	37
Univ. Minn.§	16.5	21%	23+
Green	9#	0	8‡

*Life table analysis
†Information not available
‡Median survival given only for responders who have died. Six of 26 patients still survive in CR.
#See Table 8
§Section of Medical Oncology, Masonic Leukemia Treatment Center.

It is important for the practicing physician to be aware that significant changes are occurring rapidly in the treatment of adult ANLL. Many of the factors that make long-term, disease-free survival possible for a significant percentage of patients are available only in major leukemia treatment centers. Further, the government has recently made the decision that new experimental drugs can be used only in major centers, not in community hospitals. Thus, all adults with ANLL under the age of 70 should have the benefit of contact with a major leukemia research center, so that they may receive the best current treatment for their disease.

Clara D. Bloomfield, M.D.
Minneapolis, Minnesota

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*Green, Robert A.: Treatment of Acute Leukemia 1970-1976. Minnesota Med 60:5:323, 1977.

†Associate Professor of Medicine, Director, Masonic Leukemia Treatment Center, Section of Medical Oncology, University of Minnesota Health Sciences Center, Minneapolis.

References will be found on page 497.

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Fracture Conference

Lawn Mower Injuries

HAMLET A. PETERSON, M.D.;* MARK J. CARLSON, M.D.† and
MICHAEL T. McCOY, M.D.†

Dr. Hamlet A. Peterson:

This fracture conference concerns a lawnmower injury in a child.

Case 1

Dr. Mark J. Carlson:

A 4-year-old boy was riding with his brother on a riding lawn mower. The child got off the lawn mower, and his brother, thinking the mower was in forward gear, backed over the boy's right foot. The boy was taken to the emergency room (Figure 1).

On examination, all of the metatarsals appeared to be fractured and were exposed, and all the extensor tendons were severed. In addition, there was a severe laceration on the dorsum which extended into the sole of the foot. On the medial side of the foot, the insertion of the Achilles tendon was 30% detached, and the distal tibial physis had been opened by a skiving wound across the distal tibia. There was also a massive loss of skin on the medial aspect of the foot and ankle. The boy's general condition was stable, and he had no other injuries.

Dr. Peterson:

What else should we know before we plan treatment?

Dr. Thomas D. Nagle:

What is the boy's vascular status?

Dr. Carlson:

The circulation was normal distally.

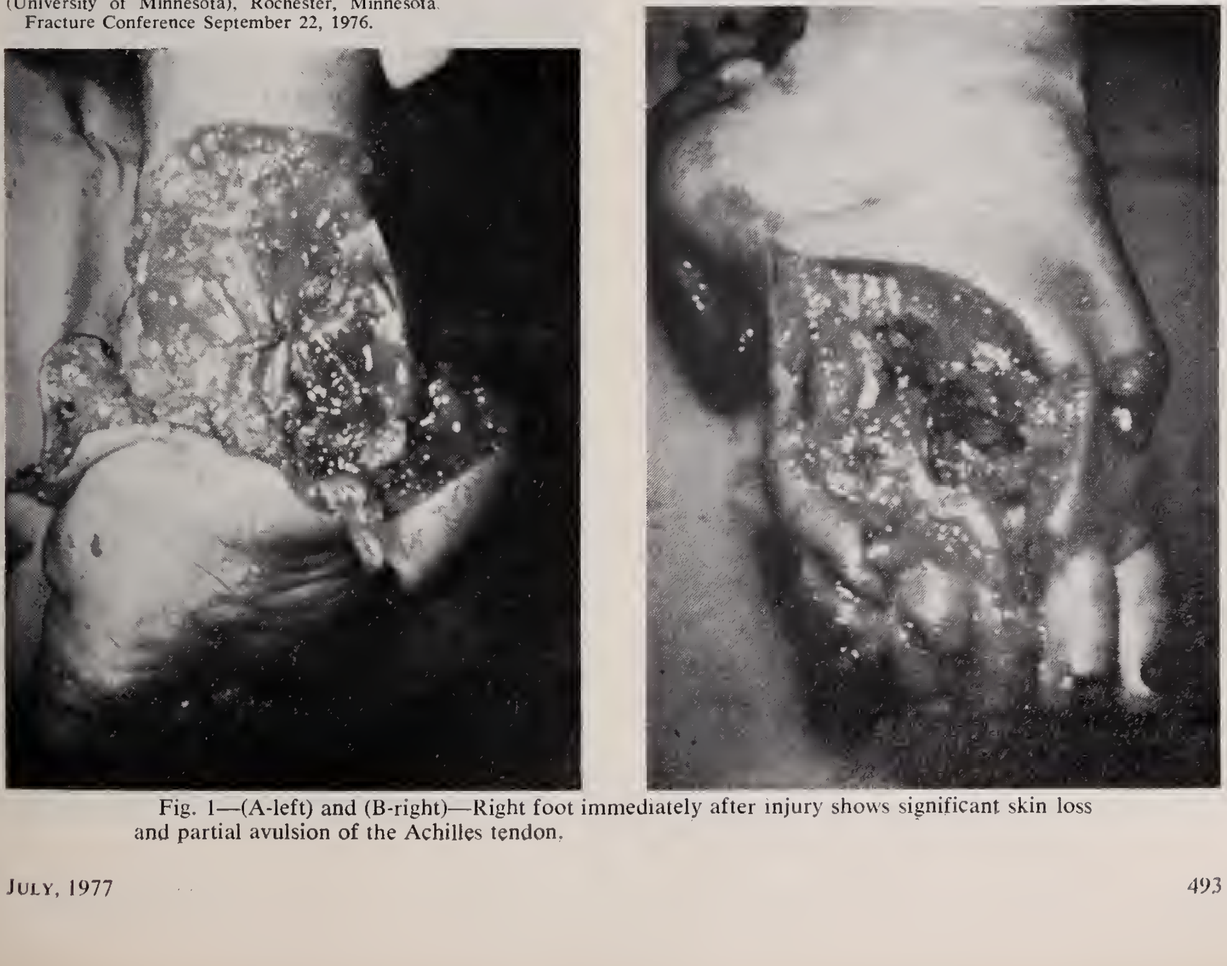

Fig. 1—(A-left) and (B-right)—Right foot immediately after injury shows significant skin loss and partial avulsion of the Achilles tendon.

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*Consultant, Department of Orthopedics, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

†Resident in Orthopedics, Mayo Graduate School of Medicine (University of Minnesota), Rochester, Minnesota.

Fracture Conference September 22, 1976.

Dr. Nagle:

Obviously, the boy should go to the operating room for debridement, irrigation, and exploration to determine the extent of the injury.

Dr. Carlson:

What else should be done in the emergency room before taking the patient to the operating room?

Dr. Nagle:

Appropriate cultures should be taken, and antibiotics should be given. Also, the boy needs adequate tetanus coverage.

Dr. Carlson:

The boy was taken to the operating room, where examination revealed that every metatarsal was fractured and that the forefoot was held intact by plantar soft tissue only (Figure 2). Should anything be done to stabilize the foot?

Dr. Nagle:

The metatarsals could be reduced and K wires used for fixation. The wounds should be left open.

Dr. Carlson:

The wound was debrided, cultures were taken, and the site was irrigated with six liters of saline. The metatarsals were stabilized with K wires (Figure 3A). The boy had a disruption of the pericondylar ring around the growth plate of the distal tibia. Disruption of the ring increases the chances of a premature partial closure of the physis and requires that the patient be observed closely in the future for a growth disturbance. The wounds were packed open; the foot was placed in a Robert Jones dressing; and antibiotics were administered intravenously. What antibiotic and what dose would you recommend?

Dr. Nagle:

Cephalothin should be a good choice, at a dose of 100 mg/kg/day, until results of cultures are known.

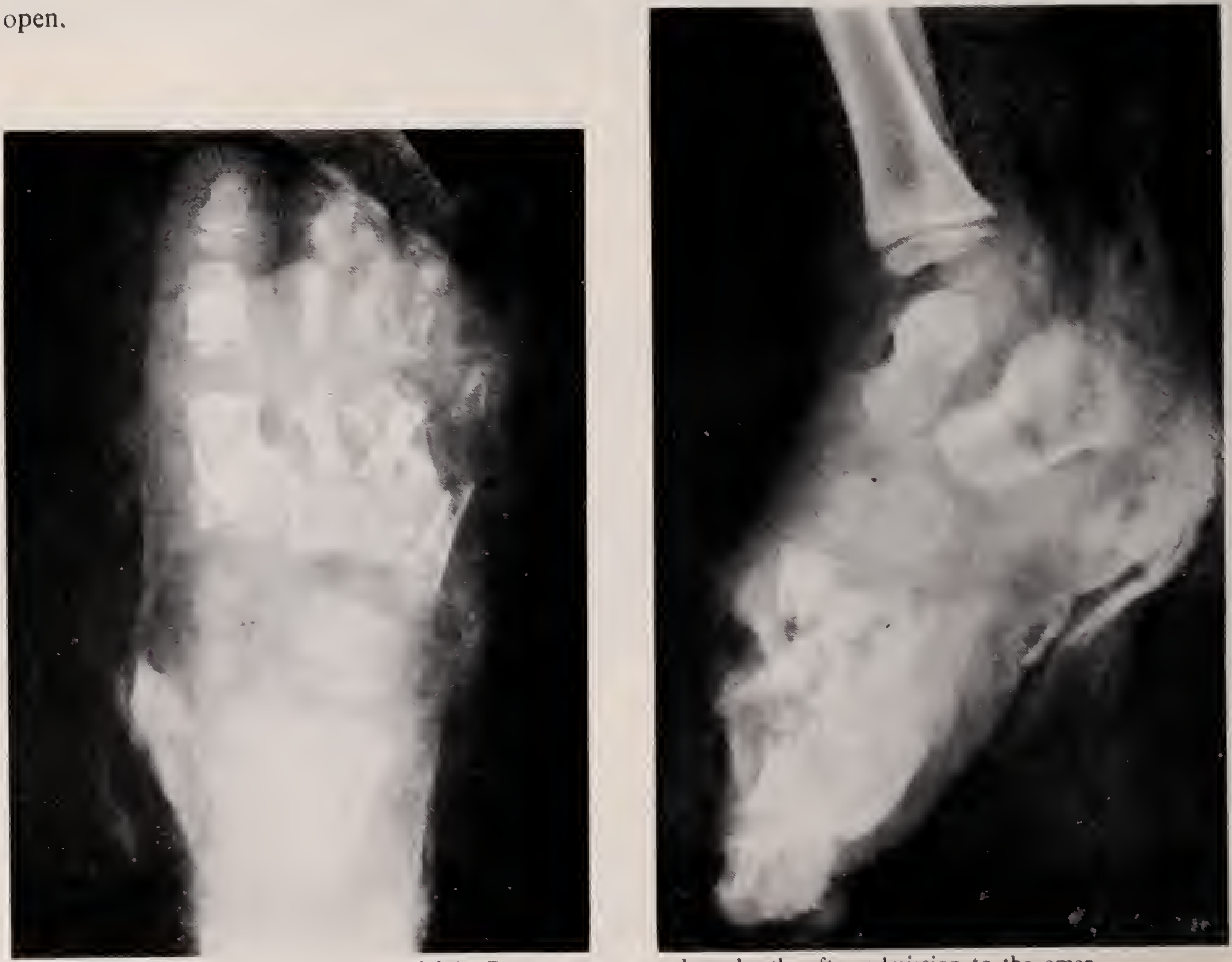

Fig. 2—(A-left) and (B-right)—Roentgenograms taken shortly after admission to the emergency room show that all the metatarsals were fractured and the calcaneous and distal tibia sustained skiving injuries.

Dr. Carlson:

Cephalothin was given intravenously in divided doses four times a day to a total dose of 100 mg/kg. Results of cultures showed a number of organisms. The organisms that we obtained sensitivities for were group B streptococci, *Staphylococcus aureus*, and numerous gram-negative organisms. Subsequently, oxacillin, ampicillin, and gentamicin were given intravenously for 18 days; this followed the use of cephalothin, which had already been given for 10 days. The boy had three dressing changes, and two weeks after his injury, a split-thickness meshed skin graft was applied to the medial aspect of his foot. Four weeks after injury, he was dismissed from the hospital. He returned to the hospital six weeks after injury and had the K wires removed (Figure 3B). He has done well. The wounds have healed, and the boy can bear full weight (Figure 4). However, he will require close observation for possible growth disturbances in the future.

Comment

Dr. Peterson:

This is a rather common type of lawn-mower injury. Usually, the foot or a lower extremity is involved.

Dr. Michael T. McCoy:

Americans buy about seven million new lawn mowers every year, and approximately 30 million lawn mowers are in use in the United States at this time.[1] Most of these are the rotary type. There are essentially four types of lawn-mower devices. The most common is the hand-propelled rotary type. Most of the lawn-mower injuries,

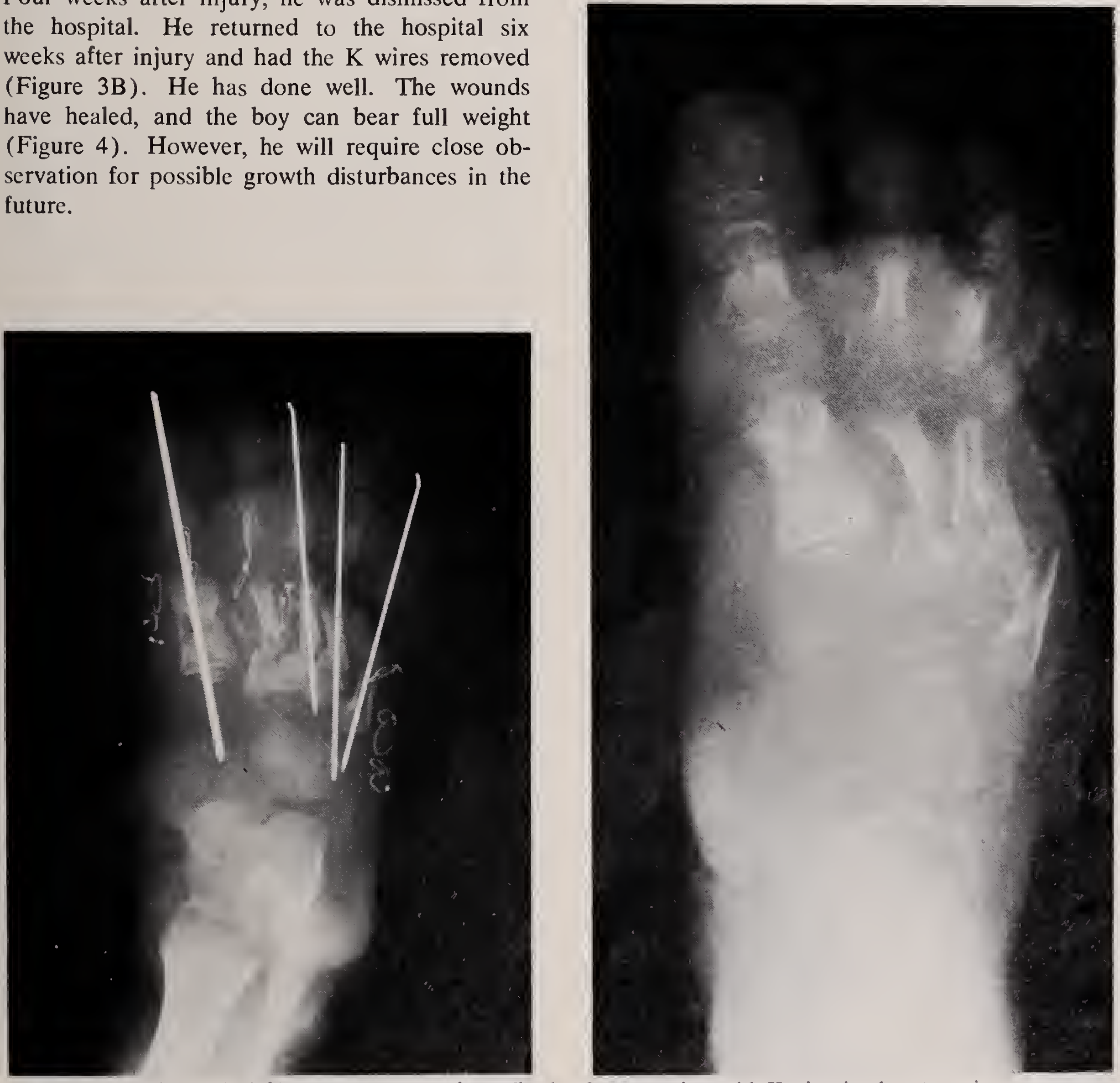

Fig. 3—(A-left)—Roentgenogram immediately after operation, with K wires in place to maintain alignment of metatarsals. (B-right) Roentgenogram six weeks after injury.

just by the sheer number, are from this type. The second is the walk-behind self-propelled type. The third type is the riding lawn mower. Injuries incurred from this machine are fewer, but they usually are more severe than injuries from the hand-propelled type. The motorized lawn tractor with the mower attachment pulled behind represents the fourth type.

An estimated 160,000 power-mower injuries occur each year in the United States. Most of the injuries result from the misuse of the hand-propelled rotary mower and consist predominantly of lacerations of the fingers and toes and of projectile injuries to the operator and bystanders. However, the most severe injuries occur in the younger child who is run over by a power mower, usually the riding type. The wounding capacity of these devices is very severe. The blade revolves at up to 4,000 revolutions/min and can develop a tip speed of about 400 km/h.

In addition to simple lacerations, the patient may suffer major skeletal injuries such as amputations, growth-plate damage, or open fractures, as was seen in the present case.

Two basic types of injuries are incurred in a lawn-mower accident.[2] The first type is a direct one that is caused by the blades striking the operator or someone else. The most common of this type is the forefoot injury in which the operator is usually running the mower on a slope that is wet, and the foot slips under the guard of the lawn mower, amputating or lacerating the toes of the forefoot. The second type of lawn-mower injury is the missile injury. These occur when small hard objects, such as stones, are struck by the blades and hurled distances up to 50 yards, with wounding potential even at this distance. The design, blade length, mass, speed, engine power, and presence or absence of propulsion and other factors are all important in determining the wounding capacity.

The following calculations were obtained from a recent article in the *Journal of Trauma*.[3] The authors considered that a typical blade weighed 3.5 lb, was 26 inches long, and rotated at 3,000 revolutions/min. This blade develops a kinetic energy of 2,100 ft-lb, which is equivalent to the energy generated by a 21-lb weight dropped from a height of 100 ft. Another way to measure force is by the angular moment. In this situation, the angular moment can be considered to be 161 lb-sec. This is equivalent to the momentum gen-

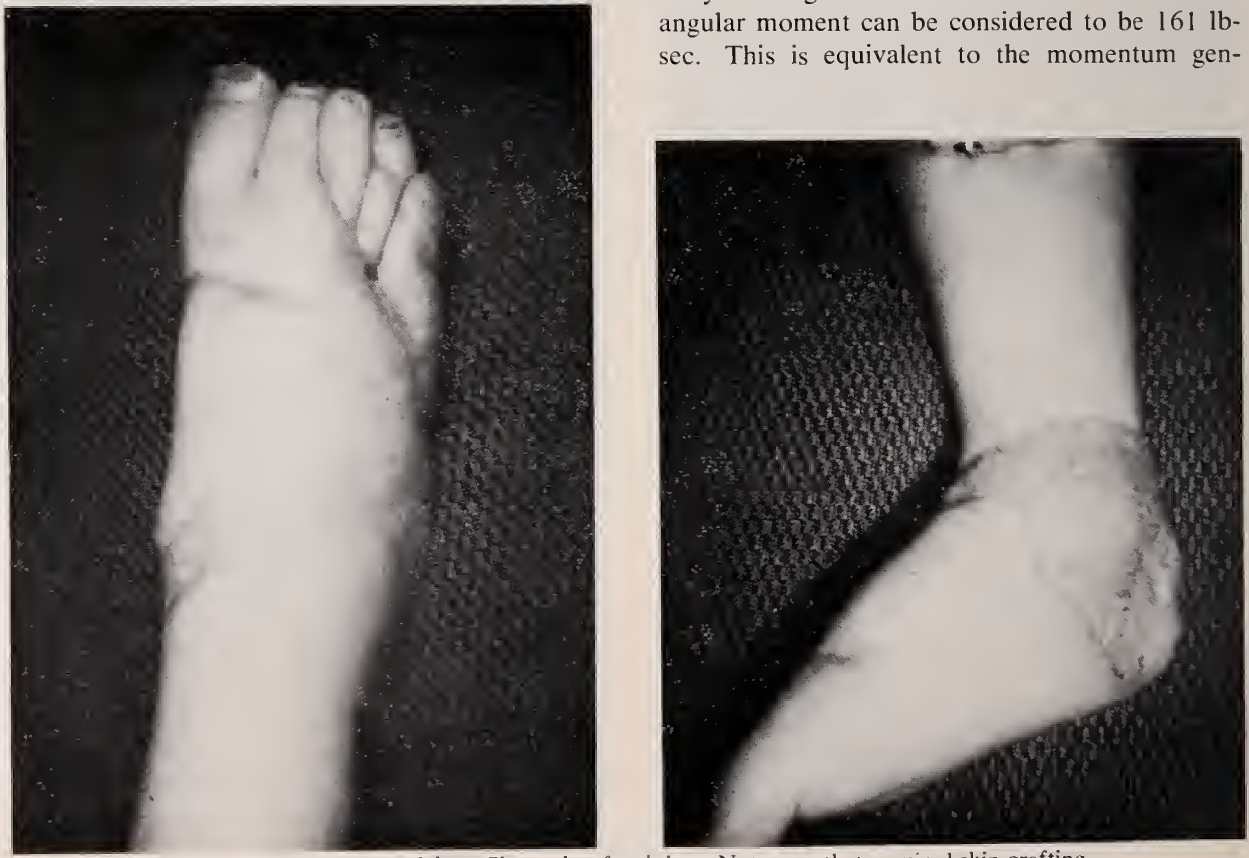

Fig. 4—(A-left) and (B-right)—Six weeks after injury. Note area that required skin grafting.

erated by a 1.2-lb weight traveling 240 miles/h.

Dr. Peterson:

Lawn-mower injuries can produce life-long disabilities. More thought should be given to the safety of the lawn mower. First, all operators should wear heavy shoes. When the blade strikes heavy leather, the depth of penetration and the number of cuts is reduced. Second, power lawn mowers should have a variable speed clutch so that, when the operator releases the handle, the machine stops. Such a safety device would reduce errors of judgment. Third, restrictions on who can operate these machines may be in order.

References

1. Ross PW, Schwentker EP, Bryan H: Mutilating lawn mower injuries in children. JAMA 236:480, 1976.
2. Hulme JR, Askew AR: Lawn mower injuries (letter to the editor). Br Med J 3:113, 1974.
3. Park WH, DeMuth WE Jr: Wounding capacity of rotary lawn mowers. J Trauma 15:36, 1975.

Treatment of Acute Leukemia 1970-1976—Bloomfield (page 491.).

References

1. Clarkson BD, Dowling MD, Gee TS, Cunningham IB and Burchenal JH: Treatment of acute leukemia in adults. Cancer 36:775, 1975.
2. Jacquillat C, Weil M, Gemon-Auclerc MF. Izrael V, Bussel A, Boiron M and Bernard J: Clinical study of Rubidazone (22 050 R.P.), a new daunorubicin-derived compound, in 170 patients with acute leukemias and other malignancies. Cancer 37:653, 1976.
3. Ohno R, Hirano M, Imai K, Koie K, Kamiya T, Nishiwaki H, Ishiguro J, Uetani T, Sako F, Imamura K and Yamada K: Daunorubicin, cytosine arabinoside 6-mercapotopurine riboside, and prednisolone (DCMP) combination chemotherapy for acute myelogenous leukemia in adults. Cancer 36:1945, 1975.
4. Yates JW, Holland JF, Wallace HJ, Jr, Henderson ES and Ellison RR: Intensive induction treatment of acute myelocytic leukemia. Proc Am Assoc Cancer Res Am Soc Clin Oncol 15:178, 1974 (abstr.).
5. Yates JW, Wallace HJ, Jr., Ellison RR and Holland JF: Cytosine arabinoside (NSC-63878) and daunorubciin (NSC-83142) therapy in acute nonlymphocytic leukemia. Cancer Chemother Rep 57:485, 1973.
6. Gale RP and Cline MJ: High remission-induction rate in acute myeoid leukemia. The Lancet i:497, 1977.
7. Peterson BA and Bloomfield CD: Treatment of acute nonlymphocytic leukemia in elderly patients. A prospective study of intensive chemotherapy. Cancer 1977 (in press).
8. Manaster J, Cowan DH, Curtis JE, Hasselback R and Bergsagel DE: Remission maintenance of acute nonlymphoblastic leukemia with BCNU (NSC-409962) and cyclophosphamide NSC-26271). Cancer Chemother Rep 59:537, 1975.
9. Bodey GP, Coltman CA, Freireich EJ, Bonnet JD, Gehan EA, Haut AB, Hewlett JS, McCredie KB, Saiki JH and Wilson HE: Chemotherapy of acute leukemia. Comparison of cytarabine alone and in combination with vincristine, prednisone, and cyclophosphamide. Arch Intern Med 113:260, 1974.
10. Bodey GP, Coltman CA, Hewett JS, Freireich EJ: Progress in the treatment of adults with acute leukemia. Review of regimens containnig cytarabine studied by the Southwest Oncology Group. Arch Intern Med 136:1383, 1976.
11. Armitage JO and Burns CP: Maintenance of remission in adult acute nonlymphoblastic leukemia using intermittent courses of cytosine arabinoside (NSC-63878) and 6 thioguanine (NSC-752). Cancer Treatment Rep. 60:585, 1976.
12. Grozea PN, Bottomley RH, Shaw MT, Tu H, Chancs RE and Condit PT: The role of cytosine arabinoside maintenance in acute nonlymphoblastic leukemia. Cancer 36:855, 1975.
13. Grann V, Erichson R, Flannery J, Finch S and Clarkson B: The therapy of acute granulocytic leukemia in patients more than fifty years old. Ann Intern Med 80:15, 1974.
14. Glucksberg H, Buckner CD, Fefer A, DeMarsh Q, Colcman D, Dobrow RB, Huff J, Kjobech C, Hill AS, Dittman W, Neiman PE, Cheever MA, Einstein AB and Thomas ED: Combination chemotherapy for acute nonlymphoblastic leukemia in adults. Cancer Chemother Rep 59:1131, 1975.

MINNESOTA MEDICINE

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Farrell Stiegler, M.D.
Cover Editor

Special Article

Hospital Utilization in the Rehabilitation of Completed Stroke

PHILIP L. MOSSMAN, M.D.*; MARLYS KERR, B.A.†; and ROBERT STEVER, B.M.†

The hospital utilization for the rehabilitation of the completed stroke patient was analyzed to show that the median time required for rehabilitation of the patient who was discharged independent was 61 days. Older patients, those discharged to nursing homes and those more dependent in their self-care, required longer hospitalizations.

THE PROPER DELIVERY of health care carries with it the responsibility for the appropriate utilization of hospital facilities. Such concern for utilization should never deny a patient adequate treatment, whereas it should encourage necessary and discourage unnecessary periods of hospitalization.

In order to calculate meaningful length of stay data applicable to stroke patients who have undergone comprehensive rehabilitation, the medical records of patients of the Sister Kenny Institute (SKI) were reviewed. The purpose of this review was to determine the length of stay for this particular hospital population in regard to rehabilitation outcome and disposition.

Method

SKI is a free-standing rehabilitation hospital which receives most patients by direct referral from acute facilities. The typical stroke patient has been treated in his small community hospital for about a month prior to admission to SKI for a comprehensive rehabilitation program and definitive discharge planning. Other referrals include patients in nursing homes who have demonstrated a rehabilitation potential and are now ready for a formal program. A third group of patients typically enter directly from home, usually with the specific goal of increasing self-care abilities.

A retrospective study of the hospital records of stroke patients admitted to SKI in the years 1970-1973 was conducted to determine the number of hospital days expended in reaching a specific status at the time of discharge. The following criteria were established to ensure a homogeneous population:

1. That this was the patient's first documented stroke of vascular etiology. The group included cerebral thrombosis, embolism, and hemorrhage, but excluded cerebral trauma. Previous transient ischemic attacks were included but previous strokes with demonstrable neurological deficit were not.
2. That the patient was admitted to SKI either directly from an acute hospital or after at most a brief period at home or in a nursing home while awaiting transfer. The two admissions—for the acute care elsewhere and the rehabilitation at SKI—had to be immediately consecutive.
3. Patients who expired during the course of the rehabilitation program were excluded.
4. Patients who transferred out of SKI to another hospital because of acute illness and did not return to complete their full rehabilitation program were excluded. When a patient was required to interrupt his rehabilitation program because of intercurrent illness, those days were not counted as part of the rehabilitation program. Generally, the patient who did not return to complete the rehabilitation program either had expired or had been discharged directly to a nursing home in a dependent or no rehabilitation potential status.
5. Only those patients for whom a definitive rehabilitation result could be assigned

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were included in this study. This included the following eight categories:

1. Discharged to home, independent.
2. Discharged to home, semi-independent.
3. Discharged to home, dependent.
4. Discharged to home, no rehabilitation potential.
5. Discharged to a nursing home, independent.
6. Discharged to a nursing home, semi-independent.
7. Discharged to a nursing home, dependent.
8. Discharged to a nursing home, no rehabilitation potential.

The independent status was assigned to those patients who were independent in their self-care and for whom assistance or supervision was not generally required. Such patients were not necessarily ambulatory; some required a wheelchair because of arthritis, amputations or previous polio. The semi-independent patient required assistance and/or supervision regularly in such things as lower extremity dressing and ambulation. In follow-up evaluations, it was not unusual for some of the patients who were discharged as semi-independent to have demonstrated further improvement after discharge. In general terms, the independent and semi-independent statuses were assigned to those patients who were considered physically able and self-sufficient enough to return to a typical home situation without extraordinary care or supervision.

The dependent patient was one who could assist only with the elemental aspects of his self-care and required assistance in his dressing, personal hygiene, transfers, and/or ambulation. Most of these patients could feed themselves, but required supervision.

The patient characterized as having no rehabilitation potential showed no ability to either learn and/or retain the rehabilitation techniques, and remained completely dependent. Whereas some of these patients could feed themselves, this too required assistance and/or supervision.

Results

In the period 1970-1973, 214 patients met the criteria for inclusion in the study. An additional seven patients expired at SKI during this period of time from sudden cardiac causes. Twenty-five additional patients were transferred from SKI for acute care at local general hospitals and did not return. The most common causes for such transfers were arteriosclerotic heart disease, thromboembolic disease and repeated stroke, in that order.

Table 1 outlines the discharge dispositions (either home or nursing home) and the discharge statuses (independent, semi-independent, dependent or no rehabilitation potential) of the 214 people who completed the rehabilitation evaluation and/or program and for whom a specific discharge status was assigned. Those who were discharged to other hospitals and never returned to SKI were usually dependent or had no rehabilitation potential and were typically discharged to nursing homes. Others subsequently died from the acute illnesses for which they were transferred to the acute facility.

TABLE 1

The Discharge Disposition and Status of the 214 Hemiplegics Who Were Evaluated at Sister Kenny Institute 1970-1973

Disposition	Status	Number	Percentage
home	independent	75	35.1
home	semi-independent	60	28.0
home	dependent	11	5.1
home	no potential	4	1.9
nursing home	independent	4	1.9
nursing home	semi-independent	22	10.3
nursing home	dependent	21	9.8
nursing home	no potential	17	7.9
		214	100.0

Table 2 indicates the average length of stay data for the patients included in this study. The acute care hospital days immediately preceded the days spent in the rehabilitation program at SKI so that this could be considered a single spell of illness with two consecutive, or linked, admissions. During acute hospitalization, the patients may have had only basic physical therapy with range of motion or early gait training, but in no instance could it have been considered a comprehensive rehabilitation program with the inclusion of rehabilitation nursing, occupational therapy, physical therapy, speech therapy or psychological services such as our comprehensive program provides. Only rarely had a patient been instructed in self-care, such as dressing or personal hygiene, prior to transfer to SKI.

TABLE 2
Average Length of Stay Data of the 214 Hemiplegics Evaluated at Sister Kenny Institute 1970-1973

Average length of stay for acute care before referral to SKI:	34.9 days
Standard Deviation	26.2 days
Average length of stay for the rehabilitation program at SKI:	38.5 days
Standard Deviation	22.1 days
Average total length of stay for the linked, consecutive admissions of acute care and rehabilitation:	73.4 days
Standard Deviation	34.1 days

Table 3 analyzes the relationship between age and the rehabilitation disposition and status. The younger patient was more apt to return home than be transferred to a nursing home. When the independent patient was compared to the other three categories of semi-independent, dependent or no rehabilitation potential, he was found to be significantly younger.

TABLE 3
The Effect of Age on Discharge Disposition and Status of the 214 Hemiplegics Evaluated at SKI—1970-1973

Disposition	N	Mean Age in Years	Standard Deviation
Home	148	63.2	11.4
Nursing Home	64	69.5	9.7
Status			
Independent	77	61.1	12.9
All Others: (Semi-independent, dependent, no potential)	135	67.3	9.5

Each distinction is significant at 0.001 level.

Table 4 notes that independent patients, when compared to the semi-independent and dependent patients, had a significantly shorter total length of hospitalization over the linked admissions for the acute and rehabilitative phases of the stroke. (A patient with no rehabilitation potential was excluded from the length of stay data because once this status had been determined, the patient would be discharged for custodial and maintenance care). The percentile total length of stay for the group of 214 patients is outlined in Table 5. Because of the small numbers concerned, the extremes of this distribution may reflect only chance variation, and therefore, our attention is directed only to the 25th, 50th and 75th percentiles. These data are compared to the P.A.S. figures for the single diagnosis of cerebral vascular disease compiled from Central United States Hospitals.

TABLE 4
Average Length of Stay Data for Combined Acute Care and Rehabilitation for Patients Discharged Independent Compared to Those Discharged Semi-Independent and Dependent

Status	Average total length of stay in days	Standard Deviation
Independent	66.4	33.3
Semi-independent dependent (combined)	82.2	33.4

Distinction is significant at 0.01 level.

TABLE 5
Percentile Distribution for Total Length of Stay Data of the 214 Patients Evaluated at SKI, 1970-1973, Compared to P.A.S. Data for the Central U.S.

Group	Number	Percentile Length of Stay-in Days 25th	50th	75th
Whole group	214	49	66	88
Independent status	79	47	61	79
Semi-independent status	82	55	72	101
Dependent status	32	61	80	91
No potential	21	38	47	53
Discharged home (all statuses)	150	51	66	88
Discharged nursing home (all statuses)	64	48	63	88
P.A.S. Single diagnosis Cerebral vascular disease Central U.S.	11,930	—	9	17

Discussion

This study has attempted to provide length of stay information on patients with first strokes who were referred for a comprehensive rehabilitation evaluation and/or program at SKI. This was a highly selective group of patients and no attempt can be made to compare these outcomes with those of other facilities. This is a description of our experience with those patients who either completed a rehabilitation program or to whom no potential could be ascribed. Obviously, our patients had a significant physical impairment and did not make a rapid spontaneous recovery in their acute hospital treatment; thus, a referral to our rehabilitation center was made. This referral process alone eliminates those who died early and those cases of minimal hemiplegia whose rapid recovery required only a brief hospitalization. At the other end of the spectrum, our referral process probably excludes many of the very severely involved patients who went directly to nursing homes. Nevertheless, because the acute hospitalization and the rehabilitation hospitalization were consecutive, the total days expended were additive. Other patients who were discharged to nursing homes before their rehabilitation potential became evident and who later benefited from a comprehensive rehabilitation program were excluded from the study since too much time elapsed between the acute hospital and the rehabilitation hospital experiences.

Thirty-seven percent of this selective population achieved an independent status. A few of these were discharged to nursing homes because of inadequate living situations at home. An almost equal number of patients were discharged as semi-independent (38.3%) but a third of these went to a nursing home usually because of their home situation rather than because of their physical disability. Of 14.9% of patients who were dependent, the family resources were adequate to allow for a third of them to be cared for at home. Even a few (four) of the 9.8% of patients with no rehabilitation potential were able to receive their custodial care at home under the supervision of a highly motivated family. The data on these 214 patients indicate that in this selected situation, 75.3% were discharged as either independent or semi-independent, whereas 24.7% were discharged as dependent or with no rehabilitation potential. If it is assumed conservatively that the 25 others who did not complete the rehabilitation program because of complicating illness would have been discharged as dependent or with no potential, this would alter these figures to indicate that 67.4% were discharged either as independent or semi-independent, and 32.6% as dependent or with no potential. In either situation, the group having the capability of returning home is still in the majority.

The average length of hospitalization for the combined acute and rehabilitative phases of treatment was approximately ten-and-a-half weeks. The numbers were too few for meaningful comparison among the eight different groups except when those who achieved independence were compared to all others, exclusive of those with no rehabilitation potential. Those without rehabilitation potential were excluded from the average length of stay study because once the determination of no potential has been made, that is the end point of the rehabilitation effort. Age again figures significantly in this analysis. Those who could return home were 6.3 years younger on the average than those going to nursing homes, and likewise, those who achieved independent status were 6.2 years younger on the average than all others. The improved rehabilitation potential of the younger stroke patient is confirmed by this present study.

Table 5 displays the percentile distribution of the length of stay data. Because of the smaller number of cases, the extremes of this distribution would be too subject to random fluctuation to be significant; thus only the 25th, 50th, and 75th percentiles are considered. Because of the small numbers, a firm conclusion is not possible, but the trend certainly indicates a longer hospitalization than the accompanying P.A.S. data reflect. If the comprehensive rehabilitation programs were conducted within the same acute care hospital of initial treatment, it is likely that some time could be shaved off the sum of the two consecutive admissions which are being reported by this study. If the intensive rehabilitation could have been started earlier, perhaps a few weeks could be saved. Nonetheless, our 50th percentile, the figure which is the most reliable of our percentile data, is significantly higher than the P.A.S. data and represents the time expended to either successfully rehabilitate the stroke patient or determine with certainty that there is no rehabilitation potential. The fact that the 50th percentile is given as nine days may be just another indication of a continuingly indifferent attitude toward stroke and the lack of a genuine rehabilitation effort.

There is no rigid control on the diagnosis of cerebral vascular diseases as reported to P.A.S. since it may include a wide spectrum.* The transient ischemic attack admitted for observation or study will have a briefer hospitalization, as will the patient with a minimal neurological deficit with rapid recovery. Accuracy of diagnosis is vital. In his study on stroke rehabilitation in a Midwestern hospital, Waylonis[2] noted that 23 out of 153 patients who were admitted to the hospital with the diagnosis of stroke had no documentable evidence of stroke. Such errors in diagnosis, particularly on briefer admissions, would strongly prejudice collected statistics.

One could question whether it is appropriate to use hospital facilities for the rehabilitation of stroke patients after their acute phase has subsided. Why not use an extended care facility in lieu of the hospital-based comprehensive rehabilitation program? The issue is not where the rehabilitation takes place but rather that it be done adequately and properly. The patients in this study were transferred to SKI for their comprehensive rehabilitation solely because their community hospital lacked the facilities. There is nothing to indicate that successful rehabilitation could not be conducted in a nursing home with an attendant financial saving. What is important is that the program be conducted by well-trained, concerned people. Extended care facilities with rehabilitation services within larger hospitals could conduct an adequate program. One should not be misled that rehabilitation can be cheap: rehabilitation is expensive because of the nature of chronic illness and the need for highly skilled personnel. The typical proprietary nursing home has more higher priorities than a comprehensive and consistent program of physical restoration for its stroke residents.

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*Subsequent editions of the P.A.S. manual have expanded the cerebrovascular disease category for better definition of diagnosis.

Kottke[3] points out, "The costs of stroke rehabilitation are high but the costs of maintenance in the dependent state without rehabilitation are higher." His studies on the cost-effectiveness of stroke rehabilitation leave little doubt that helping the hemiplegic to independence has a sound fiscal basis. Rehabilitation is part of the treatment program for hemiplegia and not an afterthought. When a patient has demonstrated potential after suffering a stroke, the appropriate length of hospitalization is that time necessary for the completion of a comprehensive rehabilitation program so that he may regain his independence and, if possible, return to his family. Unless there is a rehabilitation program of proven quality and effectiveness within an extended care facility, such rehabilitation should be allowed within a stroke rehabilitation program of a comprehensive general hospital or a rehabilitation facility. The requirements of such programs have been well documented.[4] The P.A.S. data are misleading since provision has not been allowed for the rehabilitation of the patient with completed stroke who demonstrates good potential. Such a rehabilitation candidate deserves more than immediate discharge to a nursing home, unless such a home conducts an appropriate program. Allowing the stroke patient to function at his maximum potential makes good medical and fiscal sense, and the length of intensive treatment needed for this accomplishment needs to be recognized and officially sanctioned.

Conclusions

It is concluded that the only nationally available criteria (P.A.S.) for hospital utilization for stroke patients cannot be applied to those who have completed a rehabilitation program. The P.A.S. data do not have rigid enough criteria to indicate the time requirements and bed utilization for such a program. The P.A.S. manual makes no claim that it should be used for such a determination and hospital utilization committees should not reach the improper conclusion that bed utilization for "all strokes" should be measured by the P.A.S. guidelines for nonspecific cerebral vascular disease.

In the present study, the median total hospitalization time for the patient discharged as independent was 61 days for combined acute and rehabilitation care. The time expended for those of a more dependent status was greater since obviously a longer rehabilitation effort was necessary to overcome their greater neurological deficits (Table 5). Although less time was expended on those with no rehabilitation potential, they remained in the rehabilitation setting for a sufficient length of time to ensure that their prognosis was accurately assessed.

It is further supposed that if the acute care and rehabilitation phase were conducted within the same institution without the need for transfer to a rehabilitation facility, as was the case in this present study, several more days of total hospitalization could be saved. This further economy of bed utilization can only be postulated from this report.

The improved rehabilitation prognosis for the younger patient is further substantiated.

References

1. Commission on Professional and Hospital Activities, Length of Stay in P.A.S. Hospitals, United States, Regional 1972, Ann Arbor, 1973.
2. Waylonis GW, Keith MW and Aseff JN: Stroke rehabilitation in a midwestern county. Arch Phys Med Rehabil 54:151, 1973.
3. Kottke FJ: Historia obscura hemiplegia. Arch Phys Med Rehabil 55:4-13, 1974.
4. Stroke Advisory Committee, Optimal Criteria for Care of Patients With Stroke, JAMA 226:164, 1973.

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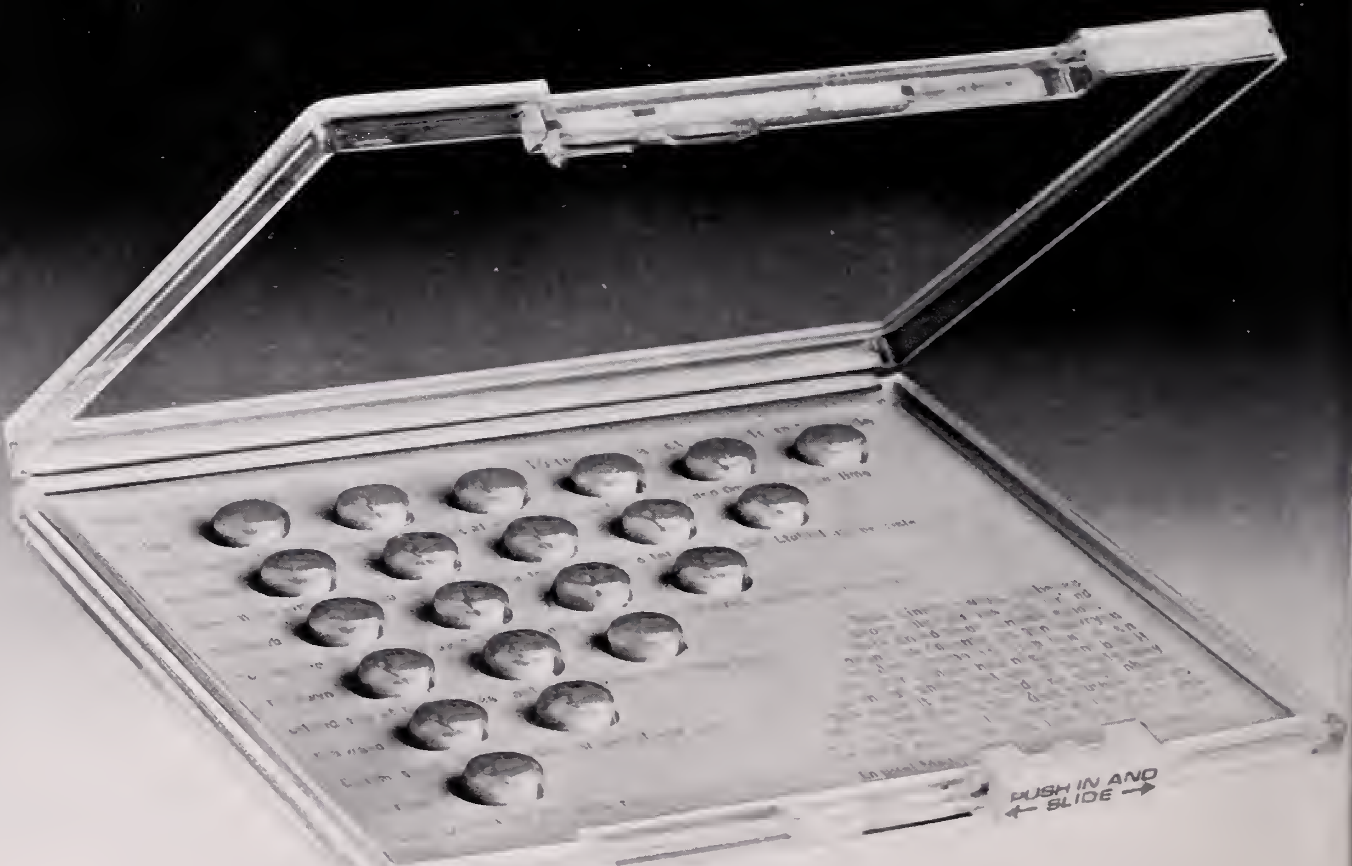

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Special Address

PL 93-641*

John B. Coleman, M.D.†

I shall discuss things which surely will affect your professional integrity and careers more than anything else since the last great discoveries and since Medicare began. I refer to Congress's plan to reform our system of medical care. The plan was made law in January, 1975. It is called PL 93-641. It is one of the most complex and thoroughly worked-over bills ever presented to Congress, I am told. Its main objectives? Hold down medical costs. Make more health care more accessible to more people. Improve the care people are getting. Who could fault this?

Where would they have patients go?

To an HMO on weekdays. To your clinic with its prepaid plan. Down to the hospital out-patient. They won't tamper with your office just now.

Who would be there to see the patient?

A nurse practitioner? Paramedic? Physician assistant? The patient's own doctor? Or the hospital's doctor who works that shift in the out-patient?

How will people pay for it?

Maybe they won't—maybe the employer or the government will pay. Maybe—if the planners are wise—the patient will pay a deductible. Maybe for some there will still be competitive fees, deductibles, ordinary health insurance, catastrophe protection, and strong peer review to protect the system.

How much will it cost?

Well, who will pay the fee? Patient? Employer? Government? Welfare? Insurance company? Remember, the payers are different today than a generation ago. Maybe like the fiddler they will claim a right to call the tune. Are you ready to negotiate that?

Maybe there will be no fees at all—have doctors on contract to HMOs, hospitals, clinics, Slowly freeze out the system of private competition. Want to sit back and settle for that? This idea is surfacing today.

Who is making these decisions?

Plenty of people. Professional government planners. Politicians. Union officers. Social activists. Employers—who pay the bills. Citizens on the HSA planning boards. And the doctors—whenever they get off their hunkers.

What has happened so far?

Through the law, a tidal wave of regulations and guide lines has swept over us. They come from the HEW, the State and the local HSAs. Our Congress and legislature support it with money. This great wave crested as PL 93-641. If it can be implemented as people in the HEW would like, it will impose State control upon private enterprise the likes of which free men in this country have never seen—even the utilities. It sets up a network of control agencies which reaches into every corner of our nation. There are administrators and controllers and staffs in Federal, regional, State and district offices. They flesh out the skeleton of the Federal law with regulations. Their regulations come to have the force of law. These are big government business men in a big industry. Talk about reducing costs.

But—this law is law. It designs a system for planning and control. It intends to revise the ways that medical care is distributed and paid for. It intends to correct shortcomings. The law purports to put the new planning in the hands of local citizens in the HSAs, under higher guidance of the State. It requires a State office to coordinate the HSAs—under higher guidance of HEW. In Washington, the HEW has a large crew making up the higher guidance. You see that the planning system is heavily bureaucratized. And for enforcement power, HEW holds clubs like regulations and money grants over the heads of HSAs just to encourage the right planning.

Still, I believe we must consider this law to be an instrument of change. I think it sprang from decades of dissatisfaction with certain aspects of our medical system—which helps justify it—and that it reflects the social convulsions which have shaken our country. Doubtless, the law got momentum in the recent era of unparalleled affluence in America when our visions told us that nothing is impossible.

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*Given at the Metropolitan Medical Center, Annual Meeting, January 10, 1977.

†Chairman of Physician's Metropolitan Health Force and Chairman of the MSMA Committee on Health Planning.

It might seem to you that we are being singled out as public problem number one. But we should appreciate that we are caught up in a flood of social and political change. Recall that not long ago there were no unions or cooperatives, no Social Security system, no Medicare, no Securities and Exchange Commission. There wasn't even The Pill. Our time has come.

We cannot ignore the signals. Doctors cannot ignore the law. Doctors cannot neglect their social duties.

But we don't need to take it lying down. Doctors can assert their rights to be consulted when changes are made just like any other citizens. They can step in when they see harmful policies being laid down. Doctors must prepare to resist without fear—in the courts, if necessary—when events develop that are bad for their patients or threaten this essential profession. Someone must raise his hand and say "no further." More than that, doctors should come out with original ideas. They shouldn't hesitate to make changes in our own system where a correctable deficiency exists. Doctors must reject the feeble position which declares "I have nothing to do with politics—and my other habits are also good."

Back to 93-641. Under the law, the basic planning group is the HSA—health systems agency. In Minnesota there are seven such citizen boards. The HSAs have limited freedom to originate and plan for local purposes. Up to date their positions are like jobbers to the business men up in HEW.

The formula for an HSA board make-up should interest you. The law prescribes consumers at not more than 60%; providers not less than 40%. Our own HSA—the Metro Health Board—has 29 members. Among the providers of medical care are one social worker, one insurance company representative, one from the VA, one pharmacist, one hospital board member, one hospital administrator, four nurses, two physicians.

This disproportion is reason enough for doctors to get into the business both as experts and politicians.

This will interest you. Who is a provider of medical care in the eyes of this law?

Congress sees five categories:

1. Insurers.
2. Professional schools.
3. Institutions—hospitals, long-term, HMOs.
4. Allied health professionals—technicians and social workers.
5. Physicians, dentists, nurses and *other* professionals.

Back to the HSA. Leave aside the consumers and providers and look at the most essential ingredient of an HSA—its staff. These are different people, paid by the government. They bring a degree of professionalism in administration, data analysis, planning etc. Many of them come from schools of public health or hospital administration. They are under the Board's authority. They are not directly responsible to the public. They do the real work of the HSA. We discovered that this is the level where most of our physician input must be directed if it is effective.

What about the doctors?

About a year and a half before Congress passed 93-641 we physicians in the Metropolitan area were confronted with an accomplished fact. It was a 70-page Health Planning document already written by staff professionals and a (mainly) consumer group. It came from the Metropolitan Health Board, which is a child of the Metropolitan Council, the Governor, and the Legislature.

Their document set down a number of rules or policies concerning citizens' rights. They outlined ways to make it easier for people to get health service. They isolated the notion that there are two kinds of care—primary care and acute or episodic care. They declare their attitudes by saying these things: "MOST PEOPLE HAVE DIFFICULTY GETTING ADEQUATE PRIMARY CARE—FUTURE EMPHASIS WILL BE ON KEEPING PEOPLE WELL—THE HMO SHALL RECEIVE HIGH PRIORITY (that means in financing)—HOSPITALS SHOULD BE DESIGNATED FOR SPECIFIC MEDICAL SERVICES (that is, franchised for neurosurgery, obstetrics, cardiopulmonary)—HOSPITALS SHOULD BE ABLE TO COMPETE WITH NON-HOSPITAL SERVICES (meaning that they should compete with a doctor's office care)—NURSES SHOULD PROVIDE PRIMARY MEDICAL CARE."

The document, I must say, was well thought out and perceptive.

We were galvanized by this. The leaders of our county societies and State Medical Association called an Ad Hoc Committee to reply to these proposed rules. We did. We made speeches. We warned and cautioned. We recommended. It was like facing a tribunal. They published their health guide.

We wondered—what is this health board? Who are these people?

We learned. These people come to official notice and are appointed. They are the activists. They are concerned people. They work hard. They donate their time and pay some of their own expenses. They are serious. They have power. They were openly hostile to doctors. They just might live next door to you.

What about ourselves? We took a look. We were reacting typically: after-the-fact, defensive, negative. Responding to somebody else's initiative. Offering no alternatives. Unprepared to meet them on their own grounds with issues and ideas. We had no facts, no data, no organized thoughts to counter theirs. We had little creditability with these people. We were at the tail end of this social action movement. We were the same doctors who generated the poor public image of the AMA and State Medical Association for years.

We decided to gear up and meet this new situation head-on. We must deal with these people eyeball-to-eyeball.

And so we began to take ideas from them. We will organize as they are organized. We must establish our own power base and face power with power. We must get together facts and knowledge and people of action. We must get into this planning act. We must move the doctors.

With the help of the County Societies and the State Medical Association we organized the Physicians' Metro Health Force late in 1974. We took on as an advisor a former member of the Metro-Council—a lawyer—to teach us what to do and how to do it properly. We had the top members of the Health Board meet with us and tell us about the laws and their own obligations. We attended their meetings in the mornings and at night. It took us more than a year to learn the ropes and learn what to do next.

This is What We Did

We organized in parallel with the Health Board. They have a Board and they appoint subcommittees called Task Forces. We formed a Board and appointed subcommittees called Reference Groups.

We realized that the Task Force is the most important cog in their machine. It is made up of their members, of consumers from the community, doctors, and any other experts they may need. The hard work is done in the Task Force, most of it by the paid staff. Decisions are made here. The Health Board ratifies, modifies or rejects. This Task Force must become our contact point to influence good health planning. If this is where changes in our system are going to be made then this is where the best possible job ought to be done. The Task Force needs our expertise and occasional wisdom.

So we organized in parallel and we formed Reference Groups of doctors. We picked the best people for their ideas and good sense. We picked them for willingness to sacrifice time, and for ability to contribute and not antagonize. They are doctors who must focus medicine's efforts upon good reform at the Task Force level.

There are Task Forces in emergency medical services, CT Scanners, community health planning—as examples. We have working Reference Groups in emergency services, scanners, pediatrics and perinatal care.

Our doctors and our staff attend their meetings. The Task Force offers its planning proposals to us from time to time for review and recommendations. By our being informative, cooperative, and honest, we think we have earned the Health Board's trust. They call upon us more often for help. They ask our nominations to their committees. We still have differing viewpoints. But we both take the position that we work for the same purpose—for the good of *their consumers* and *our* patients.

So far their most extensive propositions have been made on paper in emergency medical services, pediatric hospital care and perinatal care of mothers and infants. For example, Task Forces are dealing with the concept that different hospitals should be rated for different capabilities—so that a patient might be moved from one level to another according to the rule book. An OB patient in Chaska, for example, might under the rules be required to go to HCMC or MMC where staff is more skilled or special equipment is available—according to her diagnosed risk.

These matters raise complex issues for both doctors and hospitals—and a few hackles too. Certain hospital services may thus be upgraded and others downgraded.

Now you can see where honest cooperation from our physicians could mean a great deal to Task Forces which struggle with new ideas and new products. We aim to prevent mistakes and bureaucratic overkill. We can't afford to risk the fate of proved good features of American medical care to advocates of theoretical systems. We have the experience and expertise. And I remind you that we can learn much from them.

This is where we need you. We need you to be available. We need you to be informed about all these things. We need you to be positive—not negative. We need you to say yes and no to them. We need you to be critical but constructive. We need you to give up personal time and pleasures. Doctors have to catch up to these planners.

What the Physicians' Health Force would most like to do is to overtake them and then OUT PLAN 'EM. That's what the Health Force and our new State Medical Socio-Economics Division is all about.

Your County, State and AMA dues cheerfully paid will back our drive, but we would like to have your mind and time also.

It's our profession.

References

Porphyrias: Neurologic Aspects and the Treatment of Exacerbations—Reynolds, Jr. (page 520)

17. Marver HS and Schmid R: The porphyrias, chapter 45 in Metabolic Basis of Inherited Diseases, p. 1087, 3rd ed., by Stanbury JB, Wyngaarden JB and Fredrickson DS, McGraw-Hill, 1972.
18. Matteis F De and Gibbs A: Stimulation of liver 5-aminolevulinate synthetase by drugs and its relevance to drug-induced accumulation of cytochrome P-450. Biochem J 126: 1149, 1972.
19. Meyer UA et al.: Intermittent acute porphyria: the enzymatic defect. Res Publ Assoc Res Nerv Ment Dis 53:211, 1974.
20. Meyer UA et al.: Intermittent acute porphyria- demonstration of a genetic defect in porphobilinogen metabolism. New Engl J Med 286:1277, 1972.
21. Nagler W: Peripheral neuropathy in acute intermittent porphyrias. Arch Phys Med Rehab 52:426, 1971.
22. Peters HA: Porphyric psychosis and chelation therapy. Rec Adv Biol Psychiat 4:204, 1961.
23. Peters HA et al.: Porphyria: theories of etiology and treatment. Int Rev Neurobiology 16:301, 1974.
24. Peterson A et al.: Hematin treatment of acute porphyria: early remission of an almost fatal relapse. JAMA 235:520, 1976.
25. Ridley A: The neuropathy of acute intermittent porphyria. Quart J Med 38:316, 1969.
26. Roth N: The psychiatric syndromes of porphyria. Int J Neuropsychiatr 4:32, 1968.
27. Sassa S et al.: Studies in porphyria IV. Expression of the gene defect of acute intermittent porphyria in cultured human skin fibroblasts and amniotic cells: prenatal diagnosis of the porphyric trait. J Exp Med 142:722, 1975.
28. Sikes ZS: "Electroencephalographic abnormalities and psychiatric manifestations in intermittent porphyria. Dis Nerv Syst 21:226, 1960.
29. Sorenson AWS and With TK: Persistent pareses after porphyric attacks. Acta Med Scand 190:219, 1971.
30. Taddeini L and Watson CJ: The clinical porphyrias. Seminars in Hematology 5:335, 1968.
31. Ten Eyck FW et al.: Acute porphyria: necropsy studies in nine cases. Proc Staff Mayo Clin 36:409, 1961.
32. Tschudy DP: Enzyme aspects of acute intermittent porphyria. Mol Cell Biochem 2:63, 1973.
33. Tschudy DP et al.: Acute intermittent porphyria: clinical and selected research aspects. Annals Int Med 83:851, 1975.
34. Waldenström J: Studien über porphyrie. Acta Med Scand Suppl 82, 1937.
35. Watson CJ: Hematin and porphyria. New Engl J Med 293:605, 1975.
36. Watson CJ et al.: Effect of hematin in acute porphyric relapse. Annals Int Med 79:80, 1973.
37. Wirtschafter JD et al.: Convulsive seizures as the presenting manifestation of intermittent porphyria. Neurology (Mpls) 10:787, 1960.
38. Zimmerman TS et al.: Onset of manifestations of hepatic porphyria in relation to the influence of female sex hormones. Arch Intern Med 118:229 (1966).

Induction of Mid-Trimester Abortion with Intra-Amniotic Injection of Prostaglandin F-2$^{\alpha}$—Horowitz (page 512)

1. Kerenyi T. Mandelman N & Sherman D: Five thousand consecutive saline inductions. Am J Obstet Gynec 116:593, 1973.
2. Weinberg, PC and Shepard MK: Intramniotic urea for the induction of mid-trimester abortion. Obstet Gynec 117:513, 1973.
3. Lischke J & Goodlin R: Use of laminaria tents with hypertonic saline amnio-infusion. Am J Obstet Gynec 116:586, 1973.
4. Horowitz A & Barr M: Adjunctive use of Laminaria tents with hypertonic saline induced mid-trimester abortion. Contraception 9:409, 1974.
5. Stewart G & Goldstein P: Medical and surgical complications of therapeutic abortions. Obstet Gynec 40:543, 1972.
6. Cohen E & Ballard C: Consumptive coagulopathy associated with intramniotic saline instillation and the effect of intravenous oxytocin. Obstet Gynec 43:300, 1974.
7. Ballard C & Ballard F: Four years experience with mid-trimester abortion by amnio-infusion. Am J Obstet Gynec 114: 575, 1972.
8. Anderson G: Prostaglandin vs. saline for mid-trimester abortion. Contemp Obstet Gynecol 4:91, 1974.
9. Ballard C & Quilligan E: Mid-trimester abortion with intra-amniotic saline and intravenous oxytocin. Obstet Gynec 41: 447, 1973.
10. Lauersen N & Schulman J: Oxytocin administration in mid-trimester saline abortion. Am J Obstet Gynecol 115:420, 1973.
11. Anderson G & Steege J: Clinical experience using intramniotic prostaglandin F2α for mid-trimester abortion in 600 patients. Obstet Gynecol 46:591, 1975.
12. Robins J, Nathanson H, Fox R & Mann L: Mid-trimester abortion with laminaria, prostaglandin and Oxytocin. Advances in planned parenthood, XI:12, 1976.
13. Corson S & Bolognese F: Intramniotic prostaglandin F2α as a mid-trimester abortifacient: effect of oxytocin and laminaria. J Reprod Med 14:47, 1975.
14. Phillips L, Mohajer-Shojai E & Dillon T: Coagulation studies during second trimester abortions induced by PG F2α. Am J Obstet Gynec 119:577, 1974.

Pregnancy Termination

Induction of Mid-Trimester Abortion with Intra-Amniotic Injection of Prostaglandin F-2 α

ARTHUR J. HOROWITZ, M.D.*

Two-hundred consecutive patients underwent abortion in the mid-trimester utilizing amnio-infusion of prostaglandin F-2α. All patients were successfully aborted with a mean injection-abortion time of 24.5 hours. Morbidity was acceptable, and less than that reported for intra-amniotic saline amnio-infusion.

MID-TRIMESTER ABORTION between 16 and 20 weeks is most commonly accomplished in the United States utilizing the injection of various intra-amniotic substances to induce labor. Initial experience proved intra-amniotic hypertonic saline to be an efficient abortifacient. Potentially high morbidity has, however, generated the search for improved techniques. Prostaglandins have recently become available for clinical use, and this study examines their performance in a community hospital setting.

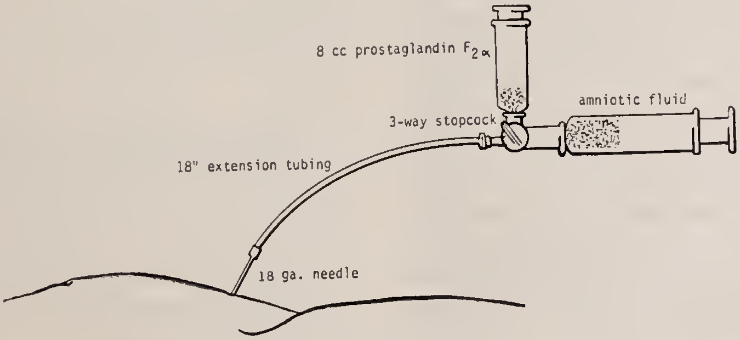
Materials and Methods

Two-hundred consecutive patients applied for elective mid-trimester abortions. All patients aborted were clinically confirmed to be within 16 to 20 weeks menstrual age, except four who were 15 weeks at the time treatment was instituted. Parity ranged from 0 to 7. The oldest patient was 44, the youngest 14.

A history and physical examination were performed, as were pap smears. Culture and smears for gonorrhea and/or vaginitis were obtained when appropriate. A prior uterine scar was not considered a contraindication to prostaglandin injection.

Patients were crossmatched for 1000cc of whole blood, and baseline coagulation studies consisting of partial thromboplastin time, thrombin time, and screening for platelets on a blood smear were obtained either as an outpatient one day prior to admission or early on the morning of admission. All unsensitized RH negative (D,D^u negative) patients were given RH immune globulin post-abortion.

Injection was carried out shortly after early morning admission. The patient was asked to void and then assumed a supine position on the exam-



Figure

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See editorial, page 489.

ining room table. The abdomen was washed with povidone-iodine solution and an aperture drape applied. The abdomen was seldom shaved, even though the injection site might traverse a hairy area.

A site about 3 cm. above the pubic symphysis was selected for amniocentesis. One or 2 ml. of 1% lidocaine was infiltrated into the injection site and the amniotic sac punctured with a 3½ inch disposable 18 gauge needle. Occasionally a 5 or 6 inch needle was necessary for an obese patient. After free flow of amniotic fluid was established, an 18 inch intravenous extension tubing and three way disposable stopcock were attached, and when possible up to 60 ml. of amniotic fluid was aspirated and left in the syringe. In no case was less than 10 ml. aspirated. 40 mg. (8 ml.) prostaglandin F2α was then injected through the tubing into the amniotic sac, utilizing the stopcock to assure that the prostin could only enter the amniotic sac (Figure). The stopcock was then re-adjusted so that the tubing could be flushed with the syringe containing amniotic fluid, so that all the prostaglandin in the tubing (approximately 3 ml.) would be delivered into the amniotic sac. Ten ml. of amniotic fluid were utilized for this purpose, and the remaining fluid, if any, was saved for the study, and the needle withdrawn.

If repeat injection was required, amniocentesis was repeated, but only 10 ml. of fluid was aspirated, and returned to the amniotic sac. All second injections were of 20 mg. (4 ml.) of prostaglandin. Reinjection of prostaglandin was carried out at 22-25 hours post primary injection if the membranes were intact, and the cervix was less than 2-3 cm. dilated and not well effaced, regardless of whether the patient was clinically thought to be having contractions.

The use of prostaglandin was abandoned and adjunctive therapy instituted if membranes ruptured and contractions failed to occur, or labor had clinically ceased, or if abortion had not occurred within 24 hours of the second injection. Adjunctive therapy consisted of oxytocin, 100 units/liter of lactated ringers run at 100 ml. per hour. If there was poor cervical dilatation, several laminaria tents were also inserted.

Within one hour of abortion, if the placenta had not delivered, or if heavy bleeding occurred, an intravenous infusion of 1000 ml. of lactated ringers solution containing 100 units of pitocin was started and run at 100 ml. per hour. After four hours, if the placenta was not delivered, it was removed in the treatment room, with or without analgesia, using a sponge forceps and a large sharp currette. Periodically the placenta was electively removed after one hour.

Patients were examined bimanually post abortion to ascertain the integrity of the cervix and lower uterine segment. If this proved unsatisfactory, a bivalve speculum was used to aid inspection. Before discharge, blood work was done which included a hemoglobin and hematocrit determination. All patients were started on oral tetracycline 500 mg. every six hours post abortion, for 16 doses, and methyl ergonovine maleate gr. 1/320 every six hours, for six doses, if blood pressure was normal, prophylactically. If clinical infection was present, appropriate high dose antibiotic therapy was instituted.

Results

All patients aborted the fetus either with prostaglandin alone or with subsequent administration of oxytocin. In no instance was surgical evacuation of the fetus necessary. Amniocentesis failed on one occasion on attempt at repeat injection. As the patient's cervix was closed and uneffaced, three thick laminaria tents were inserted into the cervix and oxytocin infusion started. The patient aborted uneventfully. In retrospect, the patient admitted to fluid loss after the first injection, and her membranes had probably ruptured, explaining the inability to aspirate amniotic fluid on repeat amniocentesis.

The mean time from initial injection to abortion of the fetus for all patients regardless of whether prostaglandin was abandoned was 23.3 hours for two-hundred patients.

Effect of Parity

Not including delivery of the placenta, 149 nulliparous patients had a mean injection abortion time of 24.1 hours, while 51 multiparous patients had a mean injection abortion time of 21.2 hours.

Incomplete Abortion

Incomplete abortion was difficult to define, as elective removal of the placenta was practiced after one hour when patient or physician convenience dictated, but usually four hours was permitted to elapse before intervention was deemed mandatory. A total of 56 patients (28%), had instrumental removal of the placenta. If oxytocin was utilized because of failure of prostaglandin alone to produce abortion of the fetus, 28 of 76 patients had instrumental removal of the placenta (37%). When prostaglandin alone was used to induce abortion, 28 of 124 patients had instrumental removal of the placenta (22.5%).

Injection Abortion Time (Table)

The total time from injection to abortion, including spontaneous passage or instrumental removal of the placenta, averaged 24.5 hours, with a range of 5.3 to 60.6 hours. Ninety-three patients (46.5%) aborted after a single dose of prostaglandin in an average of 17.5 hours, range 5.3 to 32.7 hour.s Membranes ruptured, and pitocin was used in 59 patients (29.5%) after a single dose of prostaglandin, who aborted after a mean time of 24.6 hours, range 5.8 to 48.6 hours.

If a second injection was required average injection abortion time for 31 patients (15.5%), was 34.1 hours, range 27.2 to 48.3 hours. If oxytocin was added after a second injection because of failed progress or membrane rupture, mean abortion time for 17 patients (8.5%), was 44.3 hours, range 27.3 to 60.6 hours. Ninety-eight percent (197) of patients aborted were discharged within two hospital days, and 1.5% (3) were discharged within four days of injection.

TABLE

Injection to Abortion of Fetus and Spontaneous or Instrumental Removal of Placenta

Category	# Patients	% Patients	Mean Time Hours
Single Injection	**93**	**46.5**	**17.5**
Single Injection and Oxytocin	**59**	**29.5**	**24.6**
Reinjection	**31**	**15.5**	**34.1**
Reinjection and Oxytocin	**17**	**8.5**	**44.3**
	200	**100**	**24.5**

Adverse Reactions

Eighty-two patients had 142 episodes of vomiting. 18 patients had 20 episodes of diarrhea, and 14 patients exhibited transient post injection temperature elevation of over 2° F oral after injection. In the absence of clinical infection, the temperature rise was judged due to a drug reaction rather than acute infectious morbidity, and no specific treatment was instituted.

Morbidity

Hemorrhage greater than 500cc was estimated in six of 200 patients (3%). In each instance, hemorrhage was due to mechanical factors, incomplete abortion, instrumentation, or cervical trauma in one patient. This was a 15-year-old nullipara who aborted through the posterior fornix of the vagina (lower uterine segment). The patient was transfused with 1500cc whole blood, and the laceration repaired surgically, under general anesthesia. She was discharged the day following cervical repair on oral antibiotics, and was seen two and six weeks post abortion. The cervical laceration had healed and examination revealed no evidence of cervico-vaginal fistula.

Two patients (1%) exhibited sustained febrile reaction post abortion consistent with clinical infection.

Discussion

Intra-amniotic injection of abortifacients with or without adjunctive techniques have been the procedures of choice for the induction of midtrimester abortion after 16 weeks gestation. Hypertonic solutions such as 20% saline, 55% urea have been employed to accomplish abortion in the mid-term.[1,2] Of these agents, saline appears to be the most efficient. Using refinements such as overdistention of the uterus, laminaria and oxytocin augmentation, injection abortion times of 17-18 hours[3,4] have been observed and failure to abort is rare. Unfortunately, morbidity when saline is employed, is higher. Infection as reflected by sustained temperature elevation or obvious endometritis is reported in the range of 3-9%.[1,4,5] Clinical disseminated intravascular coagulation causing hemorrhage occurs in about 1:160 patients in whom oxytocin is used and 1:800 when oxytocin is not used.[6] The procedure is technically more difficult, requiring the removal of large quantities of amniotic fluid and replacement with even larger quantities of saline. Inadvertent intravascular, intraperitoneal, or intra-myometrial injection of hypertonic saline can lead to severe if not fatal consequences. Even though series of 3500 or more consecutive saline abortions have been presented without a death[1,7] the procedure has had a discrete death rate in this country of about 5/100,000.[8]

Our results confirmed by the work of numerous other investigators indicates that prostaglandin F2α injected intra-amniotically is as effective, but probably not as efficient as saline when augmented with oxytocin and laminaria as an abortifacient. Lower injection-abortion times have been observed with oxytocin augmented saline, 17 hours with laminaria[3,4] 20-22 hours without laminaria.[9,10] However prostaglandin, even when oxytocin supplementation becomes necessary, still produces acceptable injection to completion of abortion times 24.5 hrs in our series, and 25.9 hours in Anderson's series of 600 patients.[11]

The need for instrumental removal of the placenta appears somewhat higher with prostaglandin, 28% in our material and 23% in Anderson's series,[11] than with saline 15.3%.[4] This, however, is a difficult parameter to evaluate. We generally used 4 hours as our cut-off point, as did Robins et al,[12] but other investigators suggest two hours.[13] Unfortunately there are no firm criteria that can be applied to judge when a placenta is retained. If hemorrhage occurs, immediate removal of the placenta is indicated. Intervention in less than four hours may, however, be prompted by expediency rather than necessity, and in fact early intervention was carried out in the present series, on several occasions for this reason.

Prostaglandin does have significant advantages over saline injection. There is no doubt that safety is the prime consideration. Inadvertent misplacement of the drug, with injection into the circulation can lead to rather dramatic but self limited effects.[8] Bronchospasm, hypotension and severe gastrointestinal side effects have been observed, but they are transient owing to an extremely short half life of the drug, and are reversible with supportive therapy. Moreover, utilizing the injection technique outlined, coupled with the relative ease of injecting a small amount of drug, and the need to remove small amounts of amniotic fluid, this procedure is far less apt to lead to misplaced injection of the drug than saline abortion.

Other investigators have advocated insertion of an indwelling catheter of narrow caliber into the amniotic sac, so that more agent can be added without the need for a second "procedure." However, the theoretic, if not real, fears of a lost catheter, increased infection, and greater difficulty in proving accurate placement by fluid backflow through a narrow gauge catheter, have discouraged us from this technique. Actually, puncture of the amniotic sac is usually easier the second time, since the patient qualifying for repeat amniocentesis is found to have a labored distended, tense lower segment and uterus on clinical exam, even though cervical dilatation and effacement are inadequate. Amniotic fluid "finds the needle" and squirts out under pressure on second puncture, but must be aspirated or allowed to flow by gravity at the first amniocentesis.

No evidence of hemorrhage due to disseminated intravascular coagulation was observed, during prostaglandin induced abortion in this series. Moreover, neither sub-clinical nor clinical coagulopathy has been induced when clotting parameters are evaluated during prostaglandin abortion.[14]

Disadvantages of prostaglandin when used with or without adjunctive therapy, however, are quite annoying, and can be significant. Gastrointestinal side effects; most notably nausea, vomiting, and diarrhea are frequent; occur soon after injection; and though ameliorated by anti-emetics and other drugs add significant discomfort for the patient. The need for additional intervention such as a second injection, or oxytocin augmentation is frequent, causing somewhat prolonged average hospitalization as opposed to augmented hypertonic saline injection.

The use of oxytocin can lead to water intoxication, but as in saline patients careful attention to parenteral fluid therapy, emesis, and diarrhea should prevent this difficulty.

A final consideration is that intra-amniotic prostaglandin, unlike hyertonic solutions, particularly saline but urea as well, is not feticidal; and heart tones may be detected frequently until the time of delivery.[14] It is possible to occasionally observe a fetus of under 20 weeks gestation, born with a heart beat which is transient in spite of any possible supportive therapy.

We observed delivery through the posterior fornix in one young nulliparous patient requiring surgical repair of the cervix under general anesthesia, as well as transfusion. However, the same difficulty occurs after saline injection, and it would appear that this difficulty could be substantially minimized with the use of laminaria tents.[3,4,12]

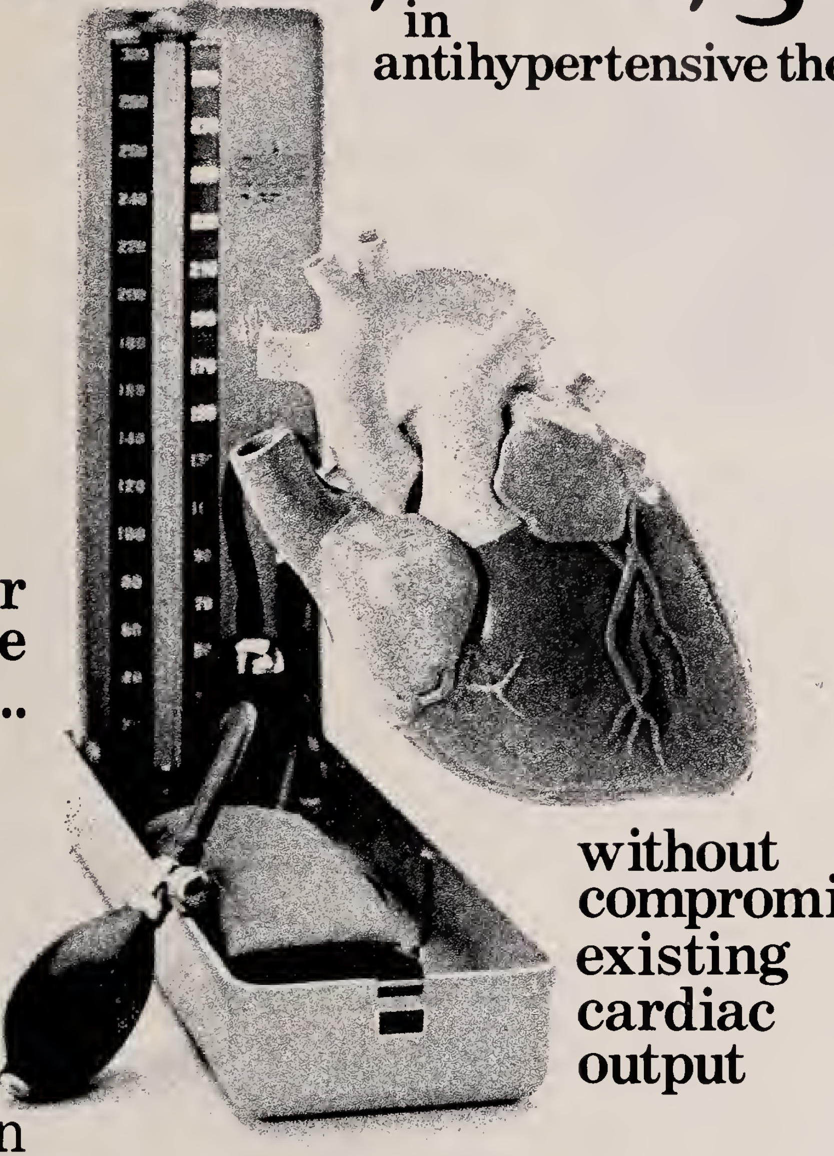
Conclusion

The intra-amniotic use of prostaglandin F2α represents a significant advance in mid-trimester abortion. Though not without morbidity peculiar to its use, this agent is significantly safer than hypertonic saline as currently used today. It is highly effective, though somewhat less efficient than intra-amniotic saline used in conjunction with oxytocin and laminaria.

References will be found in page 508.

A Dual Challenge

in
antihypertensive therapy



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For a brief summary of prescribing information, please see following page.

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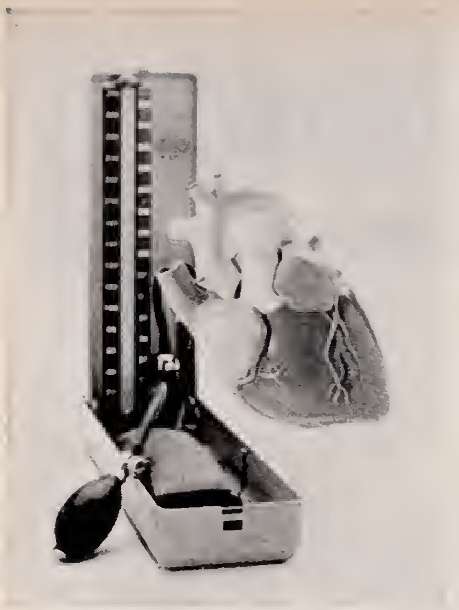

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usually with no
direct effect on
cardiac function–
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usually maintained

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Warnings: It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. Read this section carefully to understand these reactions.

With prolonged methyldopa therapy, 10% to 20% of patients develop a positive direct Coombs test, usually between 6 and 12 months of therapy. Lowest incidence is at daily dosage of 1 g or less. This on rare occasions may be associated with hemolytic anemia, which could lead to potentially fatal complications. One cannot predict which patients with a positive direct Coombs test may develop hemolytic anemia. Prior existence or development of a positive direct Coombs test is not in itself a contraindication to use of methyldopa. If a positive Coombs test develops during methyldopa therapy, determine whether hemolytic anemia exists and whether the positive Coombs test may be a problem. For example, in addition to a positive direct Coombs test there is less often a positive indirect Coombs test which may interfere with cross matching of blood.

At the start of methyldopa therapy, it is desirable to do a blood count (hematocrit, hemoglobin, or red cell count) for a baseline or to establish whether there is anemia. Periodic blood counts should be done during therapy to detect hemolytic anemia. It may be useful to do a direct Coombs test before therapy and at 6 and 12 months after the start of therapy. If Coombs-positive hemolytic anemia occurs, the cause may be methyldopa and the drug should be discontinued. Usually the anemia remits promptly. If not, corticosteroids may be given and other causes of anemia should be considered. If the hemolytic anemia is related to methyldopa, the drug should not be reinstituted. When methyldopa causes Coombs positivity alone or with hemolytic anemia, the red cell is usually coated with gamma globulin of the IgG (gamma G) class only. The positive Coombs test may not revert to normal until weeks to months after methyldopa is stopped.

Should the need for transfusion arise in a patient receiving methyldopa, both a direct and an indirect Coombs test should be performed on his blood. In the absence of hemolytic anemia, usually only the direct Coombs test will be positive. A positive direct Coombs test alone will not interfere with typing or cross matching. If the indirect Coombs test is also positive, problems may arise in the major cross match and the assistance of a hematologist or transfusion expert will be needed.

Fever has occurred within first 3 weeks of therapy, sometimes with eosinophilia or abnormalities in liver function tests, such as serum alkaline phosphatase, serum transaminases (SGOT, SGPT), bilirubin, cephalin cholesterol flocculation, prothrombin time, and bromsulphalein retention. Jaundice, with or without fever, may occur, with onset usually in the first 2 to 3 months of therapy. In some patients the findings are consistent with those of cholestasis. Rarely fatal hepatic necrosis has been reported. These hepatic changes may represent hypersensitivity reactions; periodic determination of hepatic function should be done particularly during the first 6 to 12 weeks of therapy or whenever an unexplained fever occurs. If fever and abnormalities in liver function tests or jaundice appear, stop therapy with methyldopa. If caused by methyldopa, the temperature and abnormalities in liver function characteristically have reverted to normal when the drug was discontinued. Methyldopa should not be reinstituted in such patients.

Rarely, a reversible reduction of the white blood cell count with primary effect on granulocytes has been seen. Reversible thrombocytopenia has occurred rarely. When used with other antihypertensive drugs, potentiation of antihypertensive effect may occur. Patients should be followed carefully to detect side reactions or unusual manifestations of drug idiosyncrasy.

Use in Pregnancy: Use of any drug in women who are or may become pregnant requires that anticipated benefits be weighed against possible risks; possibility of fetal injury can not be excluded.

Precautions: Should be used with caution in patients with history of previous liver disease or dysfunction (see Warnings). May interfere with measurement of: uric acid by the phosphotungstate method, creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, falsely high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. It is important to recognize this phenomenon before a patient with a possible pheochromocytoma is subjected to surgery. Methyldopa is not recommended for patients with pheochromocytoma. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites. Stop drug if involuntary choreoathetotic movements occur in patients with severe bilateral cerebrovascular disease. Patients may require reduced doses of anesthetics; hypotension occurring during anesthesia usually can be controlled with vasopressors. Hypertension has recurred after dialysis in patients on methyldopa because the drug is removed by this procedure.

Adverse Reactions: *Central nervous system:* Sedation, headache, asthenia or weakness, usually early and transient; dizziness, lightheadedness, symptoms of cerebrovascular insufficiency, paresthesias, parkinsonism, Bell's palsy, decreased mental acuity, involuntary choreoathetotic movements; psychic disturbances, including nightmares and reversible mild psychoses or depression.

Cardiovascular: Bradycardia, aggravation of angina pectoris. Orthostatic hypotension (decrease daily dosage). Edema (and weight gain) usually relieved by use of a diuretic. (Discontinue methyldopa if edema progresses or signs of heart failure appear.)

Gastrointestinal: Nausea, vomiting, distention, constipation, flatus, diarrhea, mild dryness of mouth, sore or "black" tongue, pancreatitis, sialadenitis.

Hepatic: Abnormal liver function tests, jaundice, liver disorders.

Hematologic: Positive Coombs test, hemolytic anemia. Leukopenia, granulocytopenia, thrombocytopenia.

Allergic: Drug-related fever, myocarditis.

Other: Nasal stuffiness, rise in BUN, breast enlargement, gynecomastia, lactation, impotence, decreased libido, dermatologic reactions including eczema and lichenoid eruptions, mild arthralgia, myalgia.

Note: Initial adult dosage should be limited to 500 mg daily when given with antihypertensives other than thiazides. Tolerance may occur, usually between second and third month of therapy; increased dosage or adding a thiazide frequently restores effective control. Patients with impaired renal function may respond to smaller doses. Syncope in older patients may be related to increased sensitivity and advanced arteriosclerotic vascular disease; this may be avoided by lower doses.

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Neurological Grand Rounds

Porphyrias: Neurologic Aspects and the Treatment of Exacerbations*

NORMAN C. REYNOLDS, JR., M.D.†

THE PORPHYRIAS represent a set of seven or more diseases whose pathophysiology centers about varying derangements in the metabolism of heme, the prosthetic group of hemoglobin. Afflicted patients will display such diverse manifestations as photodermatitis, colicky abdominal pain, psychic disturbances, and bizarre neurologic involvement including paralysis, seizures, peripheral neuropathy, and coma. A careful examination of the urine and feces of these patients will yield excessive amounts of some combination of porphyrins and/or porphyrin precursors, the former producing a characteristic fluorescence.

Porphyrins and Heme Biosynthesis

The porphyrins and porphyrin precursors are either intermediates or single step modifications of intermediates seen in the biosynthesis of heme. Figure 1 diagrams the steps of synthesis of heme from its starting materials succinyl-CoA and glycine. Delta-aminolevulinic acid (δ-ALA) and porphobilinogen are obligatory intermediates in the biosynthesis of porphyrins and of heme. These two porphyrin precursors and/or the porphyrins uroporphyrin and coproporphyrin will be elevated in some combination in blood, urine, and stool of porphyric patients. Uroporphyrin and coproporphyrin are single step modifications of uroporphyrinogen and coproporphyrinogen. Protoporphyrin IX α, the immediate precursor to heme, is made by oxidative decarboxylation of coproporphyrinogen III. The enzyme involved is an oxidase located within the mitochondrion. The steps from δ-ALA to coproporphyrinogen III are catalyzed by water soluble enzymes outside the mitochondrion while the initial condensation of succinyl-CoA and glycine and the final conversion step to heme both take place within the mitochondrion. The rate-limiting step in this synthesis is the δ-ALA synthetase. Note that pyridoxal phosphate (B_6-PO_4) is a cofactor in this step. This latter feature is important since some of the theories in the pathophysiology of peripheral neuropathy and of seizures in the porphyric patient dwell on this point.

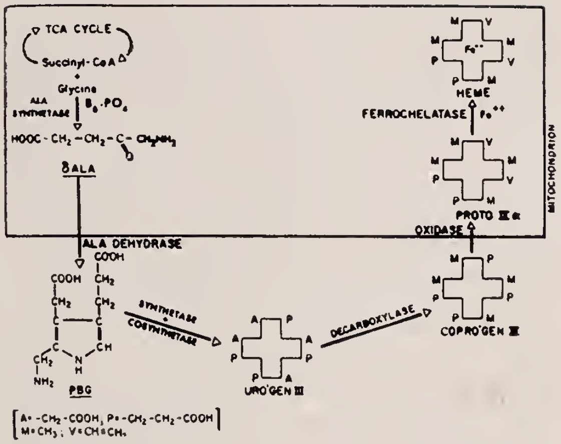

Fig. 1—By permission from Marver, H. S. and Schmid, R: "The Porphyrias" Ch. 45 in Metabolic Basis of Inherited Disease, p. 1093 3rd ed. Stanbury, J. B. et al. McGraw-Hill, 1972.

The Porphyrias as Clinical Entities

The usual approach to classifying the porphyrias is to segregate them into two fairly distinct groupings: the erythropoietic forms and the hepatic forms. In the Table the last category of protoporphyria displays both erythropoietic and hepatic metabolic derangement. Congenital erythropoietic porphyria is a rare disease with an autosomal recessive mode of inheritance. There is no sex predilection and no evidence of racial predominance. The earliest sign of involvement is the passage of dark red urine in an infant due to inter-

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*This paper is based upon material presented originally as Neurology Grand Rounds at the University of Minnesota on Nov. 21, 1975. At that time the author reviewed the literature and Dr. C. J. Watson was present as a guest speaker to discuss the background and results of his hematin infusion procedure.

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TABLE

Classification of Porphyrias.

- **I. Erythropoietic Porphyria**
  - **1. Congenital Erythropoietic Porphyria**
- **II. Hepatic Porphyria**
  - **1. Acute Intermittent Porphyria**
  - **2. Variegate Porphyria**
  - **3. Coproporphyria**
  - **4. Porphyria Cutanea Tarda**
  - **5. Toxic Porphyria**
- **III. Protoporphyria**

mittent and excessive uro- and copro- porphyrinuria. There is excessive hemolytic activity with increased reticulocytes, circulating normoblasts, and usually a mild normochromic anemia. The patients show hypertrichosis with blond, downy hair, splenomegaly, fluorescent discolored teeth, and a cutaneous photosensitivity. The hypertensive, abdominal, neurologic symptoms seen in other forms of porphyria are absent.

The hepatic porphyrias are characterized by porphyrin overproduction in the liver. The first three hepatic porphyrias in the Table have common properties. They are transmitted as autosomal dominant traits. The initial clinical features appear during late puberty and the pattern of disease includes remissions and exacerbations during which the acute phase displays increased excretion of urinary δ-ALA and porphobilinogen. The clinical exacerbations are associated with the same neurologic syndrome to be discussed later and biochemically these exacerbations are felt to be related to an increased activity of the rate limiting enzyme δ-ALA synthetase.

In acute intermittent porphyria severe colicky abdominal pain is often the presenting symptom. Hypertension and neurologic symptoms are common. Photosensitivity is rare. The disease is more frequent in English ancestry and Scandinavians. A published frequency of 1.5: 100,000 has been noted for Sweden.[17]

Variegate porphyria differs markedly from acute intermittent porphyria mainly because of obvious chronic skin manifestations including both mechanical fragility and photosensitivity. Acute neurologic and abdominal manifestations occur. The incidence of the disease is fairly high in the Afrikaner population and has been estimated at 300: 100,000 with an obvious familial pattern.[17]

Although it can be disinguished from variegate porphyria on a biochemical basis, coproporphyria is in fact clinically similar but less frequent. Many patients are usually asymptomatic or have mild intermittent abdominal, neurologic, or psychiatric manifestations. Acute attacks may occur. Photosensitivity is rare.

Porphyria cutanea tarda as the name suggests is a disease primarily limited to the skin. Aside from the vesicular and ulcerative lesions of the sun-exposed parts of the body, these patients usually have hepatomegaly but lack acute attacks with abdominal and neurologic involvement. The disease is widely distributed throughout the world.

The category of toxic acquired hepatic porphyrias emphasizes the fact that essentially completely normal people have been known to develop porphyria after hepatic exposure to toxins. The best example of this is an epidemic in Turkey in 1956 due to the ingestion of hexachlorobenzene used as an antifungal agent for wheat.[4] In this syndrome the Turks showed hepatomegaly, porphyrinuria, photosensitivity, hyperpigmentation, and hypertrichosis.

The last category of protoporphyria is an elusive one since there is no porphyrinuria but rather protoporphyrin in the feces. The clinical involvement is limited to a unique photosensitivity. Skin lesions appear as solar urticaria or solar eczema. Concretions of protoporphyrin can be laid down in hepatic parenchyma and in gallstones. The pattern of inheritance suggests an autosomal dominance.

Hepatic Porphyria and Neurologic Involvement

Only in the hepatic porphyrias do neurologic problems play a central role. Despite the apparent overlap in clinical symptoms in these diseases, a careful quantitation of the porphyrins excreted during an acute phase will yield specific diagnostic information when diagnostic tests are available. For screening purposes in neurologic disease, the porphobilinogen (Watson-Schwartz Test) need only be evaluated since we generally do not expect neurologic involvement in porphyria cutanea tarda.

Metabolic control features of heme biosynthesis give insight into possible pathophysiology of exacerbations in hepatic porphyria. When the output of heme is sufficient, the molecule exerts a negative effect upon the enzyme δ-ALA synthetase thereby producing an efficient self-regulation called "negative feedback". One could postulate the inheritance of an unusual synthetase which has lost its responsiveness to heme feedback control leading to porphyrin overproduction. One could also postulate mechanisms for reducing locally the heme concentration by trapping or by consuming heme. A metabolic block in an intermediate step could also lead to a buildup of specific porphyrins. This type of metabolic block has been identified in acute intermittent porphyria as a low activity of uroporphyrinogen synthetase.[20] This finding explains the selective elevation of urinary δ-ALA and porphobilinogen noted in acute intermittent porphyria (Figure 2). The fact that family members are known to possess low activities of uroporphyrinogen synthetase without expressing their disease clinically points to the necessity of explaining how certain endogenous and exogenous factors lead to exacerbations.

Of special importance clinically is the fact that many drugs and other chemicals are known to produce exacerbations of hepatic porphyria. The long list includes phenytoin (Dilantin®), barbiturates, alcohol, methsuximide (Celontin®), chlordiazepoxide (Librium®), meprobamate (Miltown®), isopropylmeprobamate (Soma®), glutethimide (Doriden®), methprylon (Noludar®), imipramine (Tofranil®), antipyrine and related pyrazolone compounds, ergot preparations, dichloralphenazone (Midrin®), sulfonamides, griseofulvin (Fulvicin®, Grifulvin®), tolbutamide (Orinase®), Trional®, Sulfonal®, eucalyptol, and possibly* mephenytoin (Mesantoin®), phensuximide (Milontin®), chloramphenicol (Choloromycetin®), and 2-allyloxy-3-methylbenzamide.[33]

One possible explanation of the action of drugs like phenobarbital and phenytoin involves their metabolism in the liver with a rapid turnover of cytochrome P-450. The cytochrome uses a heme prosthetic group and thus might locally reduce heme concentration. This could result in an accelerated activity of δ-ALA synthetase, which, if coupled with an inherited defect in an intermediate metabolic step, could lead to specific porphyrin overproduction.

In addition to the drugs already noted, the steroids including exogenous forms (e.g. parenteral ACTH, and oral contraceptives containing estrogens and progesterone or semi-synthetic estrogenic compounds) and endogenous forms (e.g. pregnancy or hormonal imbalance) are known to induce accelerated production of δ-ALA synthetase and thus to produce clinical exacerbations. Fasting also will lead to increased δ-ALA synthetase activity. The mechanism is not at all clear but the opposite is also true, that is, a high carbohydrate intake will decrease δ-ALA synthetase activity ("the glucose effect"). The stress of infection has also been noted to induce exacerbations.

In Waldenstrom's original series of acute porphyria he estimated 60% of the patients to have psychiatric disorders during the exacerbations and he was well aware of the dilemma of "the hysteric" who later died of respiratory paralysis.[34] In the articles by Ackner,[1] Fiume,[9] and Roth[26] there is separate agreement that the classic psychiatric profile of an acute porphyric is that of the hysteric. In fact Roth goes so far as to say that a psychiatrist seeing a case of "conversion hysteria" should always include porphyria in his differential. In addition the porphyric patient is notoriously unable to tolerate stress of any kind. Other psychiatric properties are variable and may be related to the pre-morbid personality. Hallucinations, depression, neurosis, schizophrenia, mania, and personality disorder have all been reported. The significant point is that acute mental changes often accompany the exacerbation.

Unfortunately experimental studies injecting various porphyrins into animals does not bring about changes in behavior.[16] In acute intermittent porphyria the excretion of porphobilinogen and δ-ALA fluctuates considerably and attempts to correlate peak concentration with psychiatric symptoms has failed.[1,26] One potentially useful observation is the discovery of a pyrrole called "kryptopyrrole", excreted in large amounts in

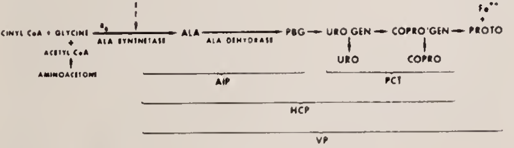

Fig. 2—By permission from Kaufman L. and Marver, H. S.: "The biochemical defects in two types of human hepatic porphyria," New Engl J Med 283:954, 1970.

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*Currently suggested by studies in laboratory animals.

some patients with acute intermittent porphryia.[12] An injection of this substance into animals is supposedly neurotoxic and causes behavioral changes.[12] The pyrrole has been found in the urine of some schizophrenics.

Neurologic involvement can be focal, multifocal, or diffuse. Ridley[25] reviewed neurologic involvement in 25 patients yielding 29 separate exacerbations. Fourteen of these patients were female and 11 were male. Ages spanned 10 to 50 yrs. Cranial nerve involvement was seen in 19 of the attacks. Multiple cranial nerve involvement was typical. The most commonly involved was the vagus in 17 attacks then the facial in 13 attacks, four of these being bilateral. Also noted were diplopia, inability to converge, bilateral ptosis, pupillary dilatation, nystagmus, and involvement of V, XI, and XII. Limb weakness occurred in each attack. In 10 cases the weakness was asymmetrical, and three of these showed a hemiplegic pattern without hyperreflexia or upgoing toes. An analysis of limb involvement showed that the upper limbs were most affected and proximal involvement greater than distal. Reflexes were hypoactive and areflexia was noted in 11 cases. Weakness of the trunk occurred in 22 attacks, 11 of which displayed respiratory weakness. 14 attacks showed vesicle sphincter involvement while seven attacks showed rectal sphincter involvement. Superficial sensory loss was seen in 17 attacks but only eight of these showed a stocking-glove pattern, the other nine being proximal sensory loss. Generalized seizures occurred in six of the attacks. Three of these occurred before the neuropathy developed and three at the height of the neuropathy. Vibration was defective at the ankle in seven cases but only one of these showed impaired toe position.

Twenty of the attacks were precipitated by barbiturates, three by sulfonamides, one by a combination of the two, and one by Doriden®. Five attacks were ushered in by mental changes, the remaining by abdominal cramps. CSF protein was studied in 13 cases and was felt to be normal in 12. Ridley points out that the more advanced cases with neurologic involvement can be similar to Guillain-Barré and CSF protein can be a useful distinction. Although the neurological findings are usually transitory, Sorenson points out that this is not always the case and that persistent pareses do occur.[29]

Microscopic features of the pathology of acute intermittent porphyria have revealed patchy demyelination and axonal degeneration in peripheral nerves, cerebral white matter, dorsal roots, cauda equina, and autonomic nervous system. Neuronal degeneration has been described in the anterior horn, dorsal root ganglia, cerebellum, dorsal vagal nucleus, facial nucleus, hypoglossal nucleus, and the coeliac plexus.[2,30,31]

The character of the peripheral neuropathy is a predominate motor involvement with minimal sensory involvement. The usual pattern is one of segmental demyelination with later axonal involvement in severe cases. Cavanagh and Mellnick have reported four cases which have come to autopsy with axonal involvement in long motor nerves as far proximal as the ventral roots.[5] Whether this was primary axonal involvement or not is the subject of some argument. In cases with only a single attack of weakness, the histology revealed regenerating neurons. Serial studies of EMG findings have been reported by Nagler in four patients with hepatic porphyria.[21] The motor conduction delays were temporary in every case. Fibrillations and large polyphasic action potentials were seen in both proximal and distal muscles. One patient displayed pseudomyotonic discharges on needle insertion at many locations. Fibrillations and large polyphasic action potentials were present early while the conduction changes appeared between three and five weeks after the acute attack.

Since the EMG findings of denervation and reinervation may be present during remissions and early during an acute phase, an EMG may well give useful diagnostic information in every porphyric patient. The clinical appearance of the neuropathy is similar to that produced by INH and in fact the common denominator could well be an induced deficiency of pyridoxal phosphate. In the porphyrias, an accelerated activity of δ-ALA synthetase could deplete available pyridoxal phosphate because of its use of this cofactor.

A review of cases in which seizures occur shows these to be either generalized major motor seizures or massive myoclonus. A therapeutic paradox is at hand especially when the patient presents with seizures since both phenobarbital and phenytoin (Dilantin®) induce exacerbations in hepatic forms. The mechanism of seizure production is not at all clear but may also be related to a depletion of pyridoxal phosphate.

The Treatment of Exacerbations

The treatment of the patient with hepatic porphyria presents an interesting challenge especially in view of the list of contraindicated medications already noted. From the standpoint of abdominal colic and psychiatric upset with intolerance to stress, the use of parenteral Thorazine® or Compazine® is indicated. Proper electrolyte balance is essential and intravenous fluid management often necessary. If the intake of parenteral fluids includes at least 300 g of glucose/24 hrs as a 10% solution, "the glucose effect" can be used in an effort to repress δ-ALA synthetase. When oral fluids are tolerated, two ounces of 10% glucose masked in cold lemonade or the equivalent amount of Glucola® can be given each hour. When oral feeding is possible, a diet balanced between 300-400 g carbohydrate, 80-100 g protein, and 50-100 g fat should be offered daily.[30] Meperidine or codeine can be used to relieve extreme pain.[33] Chloral hydrate, diazepam (Valium®), and Benadryl® are safe sleeping medications.[33] A quiet, isolated room with dim lights is the most suitable environment. In severe cases respiratory support becomes necessary.

Other medications which can be used in a porphyric patient include the morphine group, propoxyphene (Darvon®), promethazine (Phenergan®), meclizine (Antivert®, Bonine®), rauwolfia alkaloids, guanethidine (Ismelin®), tetraethylammonium bromide, atropine, neostigmine, corticosteroids (non-estrogenic), digoxin, mersalyl, penicillin G, ampicillin, cloxacillin, the tetracyclines, nitrofurantoin (Furadantin®), Mandelamine®, vitamin C and the vitamin B group.[33]

In porphyria cutanea tarda phlebotomy can induce complete remission of photocutaneous manifestations. The recommended procedure is sufficient blood-letting over two to three months to reduce serum porphyrin levels to 20% of the starting values. The period of remission will then run from six to 12 months after which time additional phlebotomy is necessary. In regions in which significant sun exposure is limited to the summer months a single early spring period of bleeding is probably sufficient.[30]

Anticonvulsant therapy predictably worsens seizures and other porphyric symptoms.

Therapeutic trials of pyridoxine 400-500 mg daily have been followed by gradual clinical improvement but the results were not striking.[23] Variable improvement has been noted following hemodialysis.[6]

The use of chelating agents has attracted considerable attention in the literature.[22,23] Some clinical observers have noted increased urinary zinc or copper during exacerbations. High cation levels may be involved in metabolic blocks of heme biosynthesis. BAL® has not been felt to be as effective as EDTA. Typical doses of the latter vary from 1½-2½ g daily in 1000cc D_5W. This is supplemented with forced fluids of at least 3000cc iv daily. The protocol is followed for five to seven days.

One of the most promising therapeutic endeavors is the use of intravenous hematin to induce remission by reducing the activity of the δ-ALA synthetase. This approach to treatment has been developed and used with great success by Dr. C. J. Watson and colleagues[7,35,36] in erythropoietic and acute intermittent porphyria. Prompt improvement has been noted in neurologic, psychiatric, gastric and respiratory distress signs and symptoms beginning about 42 hours. after the initial infusion. In a recent publication[24] a near fatal relapse in a 21 yr old female with acute intermittent porphyria was reversed within 48 hrs by a remission of both severe central and peripheral neurologic involvement. Decreases in serum and urinary δ-ALA and porphobilinogen are documented. The dose used was 3.6mg/kg hematin infused intravenously over 15 min., then followed by 2.5 mg/kg q. 12 hrs for four doses.

The most effective treatment of porphyria is prevention. In a patient with a positive past history, avoidance of factors known to exacerbate the disease is essential. This includes periods of fasting and the many drugs already noted. Genetic counselling is necessary since the common mode of inheritance is autosomal dominant (recall that erythropoietic porphyria is the exception and is autosomal recessive). Because of the implications of steroids in exacerbating the disease, pregnancy must be viewed not only as a genetic risk to the offspring but as a direct risk to the mother. Relapses in hepatic porphyria have been observed during pregnancy and in some cases precipitated at the time of delivery with some of these being fatal.[38] Most women with latent acute intermittent porphyria tolerate pregnancy with little difficulty despite large amounts of porphobilinogen in the urine.[30] On the other hand, some women will have recurrent cyclic exacerbations associated with the onset of menses.[38] Although some of these females with cyclic exacerbations have been helped with oral contraceptives,[33] oral contraception should be avoided or used cautiously in these people until further studies have clarified this matter because of the ability of the estrogen or progesterone to induce an exacerbation.

In afflicted families latent forms of the disease may be clinically silent but nevertheless just as capable of exacerbation as the more obvious cases with a past history. Although the Watson-Schwartz test for urinary porphobilinogen is an adequate screening device for patients with neurologic disease during an exacerbation, it will fail to detect some asymptomatic patients since their excretion of porphobilinogen can be negligible.[3,15,20,27] Enzyme assays of high sensitivity have been developed for uroporphyrinogen synthetase in red cells[15,20] and in fibroblast cultures from human skin[3,27] This latter technique has been adapted for amniocentesis.[27] These techniques can identify the latent porphyric with negative past history and minimal porphyrinuria thus leading to genetic counselling and medical advice otherwise overlooked. Further effort to develop new assays and to apply those already developed must occur before this avenue of identification becomes generally available to the practicing physician.

Summary

1. The clinical aspects of the porphyrias were described with special emphasis on the hepatic forms since it is these forms which involve neurologic disturbances.

2. The presenting features of hepatic porphyria are usually abdominal colic autonomic neuropathy) or occasionally psychic disturbances (hysterical personality). Additional features include peripheral neuropathy, seizures, cranial nerve palsies, sphincter involvement, hemiparesis, proximal weakness, respiratory weakness, and coma.

3. The etiology of the porphyrias was discussed in terms of metabolic derangement in the pathway of heme synthesis. Various combinations of excessive porphyrins and porphyrin precursors are seen in specific forms of the disease, but the Watson-Schwartz Test for urinary porphobilinogen was considered an adequate screen for hepatic forms during the exacerbation.

4. Genetic aspects were discussed with particular attention to recent developments in enzyme assays useful in identifying the disease prior to the appearance of both porphyrinuria and clinical disease state.

5. Special emphasis was placed on the metabolic control features of the rate limiting enzyme δ-ALA synthetase and its cofactor pyridoxal phosphate.

6. Drugs which produce exacerbations of hepatic porphyria were enumerated and contrasted with drugs clinically effective in the treatment of hepatic porphyria. Of particular significance are the anticonvulsants which aggravate seizures rather than control them. Other treatment modes and preventive measures were discussed.

Acknowledgment

The author wishes to thank Dr. L. Taddeini for his encouragement and suggestions.

References

1. Ackner B et al.: Acute porphyria: a neuropsychiatric and biochemical study. J Psychosom Res 6:1, 1962.
2. Baker AB and Watson CJ: The central nervous system in porphyria. J Neuropath Exp Neurol 4:68, 1945.
3. Bonkowsky HL et al.: Porphyrin synthesis and mitochondrial respiration in acute intermittent porphyria: studies using cultured human fibroblasts. J Lab Clin Med 85:93, 1975.
4. Cam C and Nigogoysan G: Acquired toxic porphyria cutanea tarda due to hexachlorobenzene. JAMA 183:88, 1963.
5. Cavanagh JB and Mellnick RS: On the nature of the peripheral nerve lesions associated with acute intermittent porphyria. J Neurol Neurosurg Psychiat 28:320, 1965.
6. Chugh KS et al.: Haemodialysis in acute porphyria. J. Ind Med Assoc 63(3):102, 1974.
7. Dhar GJ et al.: Effects of hematin in hepatic porphyria. Annals Int Med 83:20, 1975.
8. Elder GH et al: Letter: oral contraceptives and the liver. Br Med J 1:37, 1975.
9. Fiume S and Vella G: Psychiatric features of porphyria. Panminerva Med 8:271, 1966.
10. Fowler CJ and Ward JM: Porphyria variegata provoked by contraceptive pill. Br Med J 1:663, 1975.
11. Holt GW: Porphyria and neuronal dysfunction. Amer J Med Sci 245:95, 1963.
12. Irvine DG and Wetterberg, L: Kryptopyrrole-like substance in acute intermittent porphyria. Lancet 2:1201, 1972.
13. Kaufman L and Marver HS: The biochemical defects in two types of human hepatic porphyria. New Engl J Med 283:954, 1970.
14. Kosower NS and Rock RA: Seizures in experimental porphyria. Nature 217:565, 1968.
15. Magnussen CR et al.: A red cell enzyme method for the diagnosis of acute intermittent porphyria. Blood 44:857, 1974.
16. Marcus RJ et al.: Electroencephalographic and behavioral effects of experimental porphyria in the rat. Electroenceph Clin Neurophys 29:602, 1970.

17-38. Will be found on page 508.

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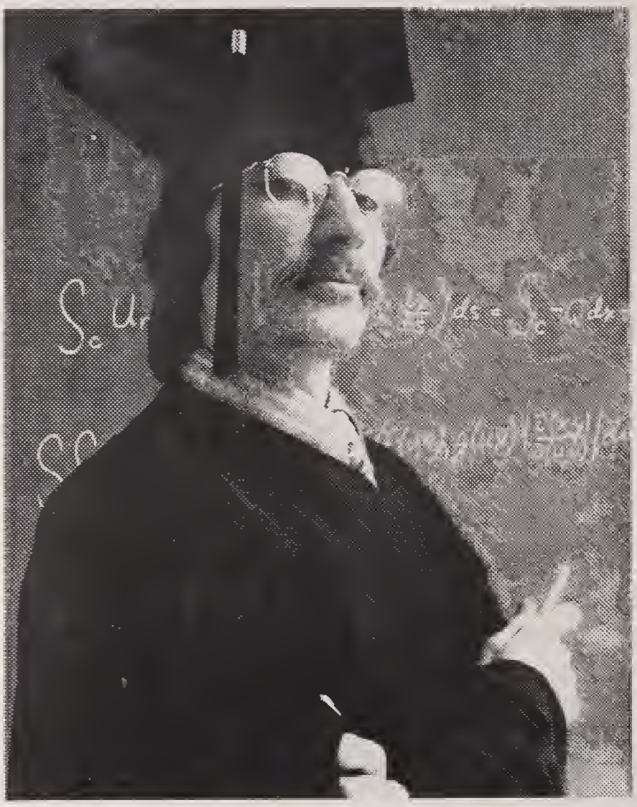

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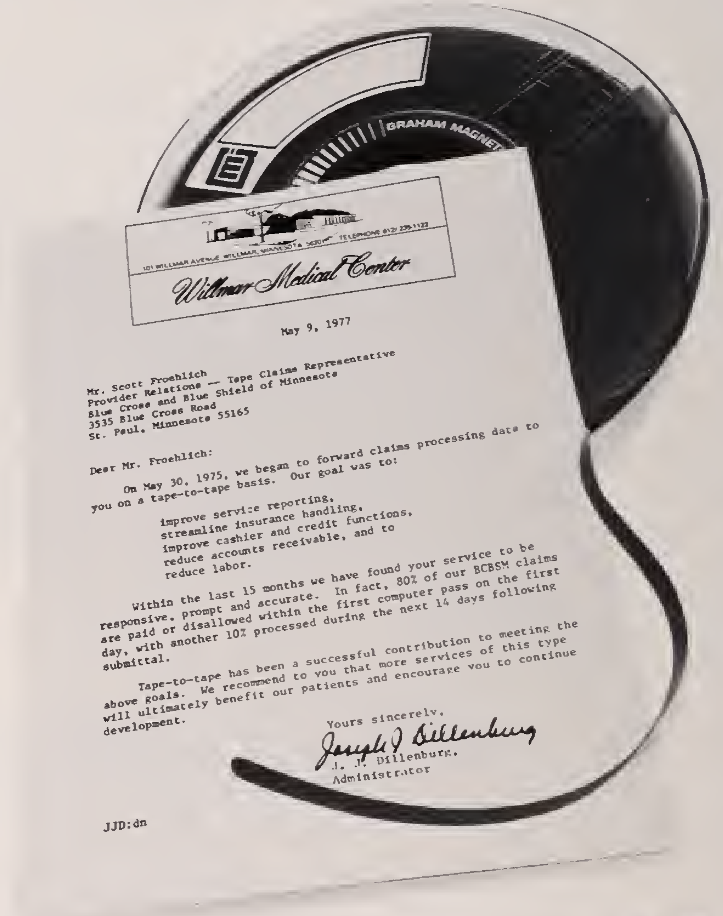

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Rehabilitation Medicine

Sexuality and Physical Disabilities

The Physician's Role

THEODORE M. COLE, M.D.* **and SANDRA S. COLE, B.A.†**

Establishment of sexual health is seldom a goal of medical treatment. However, information is now available to physicians allowing inclusion of sexuality in the treatment of disabled patients. Physical disabilities can be classified into four groups according to different influences upon the patient's sexuality.

ADULTS WITH PHYSICAL disabilities are sexual people. Because of this, sexual problems of the physically disabled may be brought to the attention of health practitioners in a variety of forms. Often, however, sexuality is not dealt with by the hospital staff. Even social workers often avoid or bypass the topic believing or hoping that it has been covered already by someone else. Sometimes, however, sexual issues confront the physician in unavoidable ways. Consider the following four incidents known to the authors.

Case Reports

Case 1

A hospital night nurse discovers a 78-year-old man in bed with an 80-year-old woman, attempting sexual intercourse. The woman is clearly confused and senile and the man is questionably so. The nurse informs you of this situation. What do you do? A variety of actions are possible: reprimand, separation of the couple and relocation of one of them to a distant part of the hospital where he or she cannot be found again by the other, closing the doors and allowing the activity to continue, counseling with the couple or stopping them and arranging for closer supervision in the future. In this particular case, the woman was moved to another part of the hospital, away from the familiar environment of her room and staff where she deteriorated and became more confused.

Case 2

A 26-year-old woman, brain damaged from trauma, is about to be discharged from the hospital to return to her apartment and a female roommate when the nursing staff learns that the two women are gay and are involved in an intimate relationship. The nurses take the position that they will not participate in a discharge plan which puts one woman into the arms of another. What do you do? Again, you have several choices: report the activity to the patient's family, counsel with the patient to convince her to find separate living arrangements, disagree with your staff and assist the patient as she continues to work out her discharge plan of resuming living with her roommate or ask the chaplain to see the patient and discuss the matter. In this case, the physician met with the staff and persuaded them that their personal sexual values should not determine the sexual choices of another adult who is willing and able to excercise responsibility for her own actions.

Case 3

A young man wth severe atheto-spastic cerebral palsy is in the hospital for further rehabilitation. He loudly demands of the hospital staff that he be provided with a sexual outlet. What do you do? A tempting choice is to explain to the patient that the hospital cannot provide that service and then ignore his further demands. In this case, however, the patient was provided with the first substantial sex education of his life. His parents were kept fully informed of the content of the educational effort so they could reinforce him. As a result, the man ceased his demands and thanked the staff for being the first to tell him about the adult world in which he had been trying to live since his puberty.

Case 4

A 50-year-old married woman with failing kidneys becomes quadriplegic in an automobile accident. The patient's physician tells her that the indwelling catheter in her urinary bladder will likely lead to a urinary tract infection which she can ill afford because of her kidney disease. He tells her that sexual intercourse with the catheter in place will probably increase the likelihood of bladder infection and therefore she must refrain from sexual intercourse which might compromise her remaining renal function. She cries. What do you do? The authors are unaware of the outcome of this case, but the fact that it occurred signals a need for physicians

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and other health practitioners to become more aware and educated in the area of sexuality of physically disabled adults.

Sexual problems among general medical patients are not rare. Burnap and Golden found that sex related problems were reported by an average of 15 percent of patients seen by non-psychiatrist physicians in California.[1] Others have found physicians reporting sexual problems in their patients ranging from one to 50 percent, depending upon the physician's specialty and whether or not he looked for them. It has been suggested that virtually all patients at one time or another have sex related problems which could be brought to the attention of their physicians. They should be questioned about sexual problems in the medical interview.

Why do physicians seldom ask their disabled patients about sexual concerns or avoid sexual issues when they are offered? Some do not search into this area because they neither know the questions to ask, nor have the skills to use the information. Others are concerned that this is too private an area to justify its inclusion in the medical interview. Still other physicians feel that this area is the province of the obstetrician-gynecologist, psychiatrist or marriage counselor. Lastly, there are some physicians who believe that sexual health is not a concern of the medical profession.

Through working in sex education efforts with many Minnesota medical students and physicians, the authors have found a more fundamental reason for the exclusion of sexual history taking—physician discomfort. It is doubtful that the major reason for not bringing sex information and counseling to the disabled adult patient is lack of information. The medical literature contains considerable information on sexual function in selected physical disabilities. Most notable among these is the sexual function of patients with spinal cord injuries,[2] coronary heart disease,[3] arthritis,[4] and diabetes mellitus.

Training of the Physician

The need and appropriateness of physician inquiry into this area of a person's life depends upon the physician's awareness and clinical skills, his patient population and the institution or facility in which he works. Preparation will involve some effort to gather information but even more to examine one's own sexual attitudes which may influence the doctor-patient interaction.

The physician can more adequately help with sexual problems caused by physical disability if he assumes that physically disabled people have sexual concerns. Because sex is a natural function these concerns can be dealt with like other natural functions such as digestion or menstruation. It is also useful for the physician to recall that sexuality is not equivalent to genitality. The genitals are often used for sexual expression, but a person's sexuality also includes information, experiences, attitudes and values. The physician can also help his patient by explaining that guilt need not be associated with sex. We recognize that it often is but it can be ameliorated through understanding and education. Many patients may be benefited when the physician conveys the message that sexual health involves not only biological function but physical competence and psychological comfort as well.

Many physically disabled people (and some able-bodied people as well) recognize discomfort with their own nude bodies. The physician can help a patient to understand and accept the body and thereby be more able to use it in sexual expression. Lastly, the physician can help each person to understand that he is entitled to his own beliefs, convictions or hang-ups and that they are often the essence of one's charm, more to be understood than to be abandoned.

Preparation of a physician to deal with sexuality of his disabled patients requires training in three areas. The first of these is to learn to recognize the sexual components of illness and disability. This should not be narrowly understood to mean genital function. For many people there is a clear relationship between sexuality and self-esteem. Therefore a physical disability which encroaches upon self-esteem could be expected to have had an impact upon the individual's sexuality and vice versa. As disabilities limit the individual's performance, they may also limit his comfort to deal with himself or with others. To the extent that comfort is lacking, anxiety may emerge which may create new sexual dysfunctions. Some physical disabilities have a clear relationship with fertility and/or genetic transmission. As the physician deals with these he may also see below the surface of these questions and find concerns about sexuality and sexual function. In other physically disabled patients, the physician may find that the disability creates difficulties in forming personal relationships or in maintaining those already formed. Here too, the physician can probe and may find that woven through the relationship problems is a backdrop of a fear, guilt, and misinformation about sexuality which can be corrected by information and endorsement.

Secondly, the physician can train himself to provide help for the sexual aspect of a patient's health. Depending upon his inclinations and specialty, the physician may simply provide "sexual first aid." For other physicians, signs and symptoms of sexual dysfunction may crop up only in isolated or fleeting situations and demand perceptive, sensitive and immediate action on his part if he wishes to learn more and to be helpful. For example, the physician may discover sexual problems in an arthritic patient whose joints are so painful that even moderate sexual activity might be painful. The physician may also be able to be helpful with a patient who is dying of a terminal illness and whose need for understanding and intimacy may be greater than ever before through this difficult period.

Thirdly, the physician can learn when to refer his patient to someone with additional skills. In this respect, sexuality is no different than any other aspect of medicine. The physician knows the limits of his abilities and in the interest of his patients, knows when to seek consultation.

All three of these aspects of physician performance—recognition of sexual components of physical disability, provision of care dependent upon one's interests and limitations, and use of referrals—should be practiced within the context of a positive attitude towards sexuality. The physician should be able to bring his patient a low burden of sexual guilt and a high level of sexual awareness in order to provide the most useful information and advice about sexual function associated with physical disabilities.

Physicians in the upper midwest have an unusual opportunity to obtain continuing education in sexual aspects of able-bodied as well as physically disabled patients. For the last several years, the Program in Human Sexuality at the University of Minnesota Medical School has been conducting continuing education programs for health practitioners and students in our region.[5] There is a variety of such programs, some dealing with sexuality of adolescents, others with adults and still others with specialized focus such as sexuality and physical disabilities. These training programs utilize the method of desensationalizing sexuality which was developed by the National Sex Forum, San Francisco, California and has been further refined at the University of Minnesota. The training format is a seminar which facilitates personal sexual attitude reassessment. The reassessment process is abetted by the use of explicit films and small group discussions lead by trained leaders most of whom are disabled. These components are coupled with didactic presentations of medical and counseling aspects of sexuality, including anatomy and physiology of able-bodied and physically disabled adults. Opportunities for the physician to develop competence in conducting sex-related interviews are also included in the seminar format.

We have learned that the physician or any other health practitioner learns how to integrate sexuality into his professional role if he understands his own personal sexual attitudes. The seminar format, therefore, encourages each participant to attend with a "significant other" person, a spouse, fiancee, or other person with whom the participant can discuss personal aspects of life, such as sex. Dr. Harold I. Lief points out that learning about sex is not like learning about anatomy.[6] In order to understand sexuality, the learner must be aware of his own feelings about the sexuality of self and others. Delicacy and tact in counseling are essential to effectiveness as are the absence of shame and false modesty, which constitute handicaps for the physician.

Classification of Disabilities

It is not necessary that the physician familiarize himself with the wide variety of physical disabilities which can affect sexual function. It is beyond the scope of this paper to explore all of the physical impairments which may affect human sexual expression. However, it is useful to have a frame of reference when thinking about several physical disabilities and how they may affect human sexuality. For the sake of classification, physical disabilities can be placed into four groups.[7] Each group is distinguished by either the progressive or static nature of the disability and the time of onset relative to puberty. However there is overlap in organ system involvement between the four types. In other words, the central nervous system may appear in all four types but the differentiating feature is whether or not the organ system disorder is stable or progressive and whether it had its onset before or after puberty. Using this scheme it is possible to assess every patient from the point of view of functional impairment, thereby providing a framework for considering the effect of the disability upon sexuality and the therapeutic possibilities. For the purposes of this classification, it is assumed that the disabled person has an able-bodied person for a sexual partner.

Type 1 includes the nonprogressive physical disabilities which are acquired at birth or in childhood prior to puberty. Examples of disabilities in this group included diseases or injuries of the central nervous system, musculo-skeletal system, cardiovascular system and special sensory organs. Children having these disabilities have grown up as conspicuously different from normal children. The conspicuousness of their disability has often resulted in their segregation and has denied them opportunities to interact with peers and learn basic social skills. Therefore, the psycho-sexual socialization process has been influenced and maturational retardation or arrest may occur in one or more areas. In addition, if the disease or injury affects the spinal cord, the males may have lost their fertility. For those people whose pelvic organs are denervated or for those who have amputations or deformities of their limbs, masturbation or coitus, as customarily done, may seem impossible. Clearly disabilities which seem to foreclose upon self-pleasuring masturbation have a profound effect upon psycho-sexual development and therefore influence the child's sexual adjustment, self-acceptance and understanding of his or her own body.

Type 2 includes the physical disabilities which are acquired in early life or before puberty and are progressive. Examples of these disabilities include diabetes mellitus, muscular dystrophy, deficiency diseases, central nervous system diseases and progressive loss of cardiac, visual or auditory function. These disabilities have an effect similar to stable prepubertal disabilities described in Type 1, with the compounding element of progression. Progression makes adjustment to the disability tenuous since the individual's ability to function during one year may be reduced in the next. Therefore the child not only has to cope with the problems of socializing in a society which has difficulty in accepting conspicuously different people but also has to cope with his own changing body. Coping mechanisms learned in one year may not apply the next. In addition, the attitudes of adults, especially parents, may become solicitous and overprotective from the point of view of the child who needs to become independent and resourceful. It is not difficult to see that overprotection by adults can produce unfortunate consequences as the child moves into and beyond puberty.

Type 3 includes the physical disabilities which are acquired abruptly in adult life or after puberty but are nonprogressive. Examples of these disabilities include central nervous system disorders causing motor or sensory paralysis, skeletal amputations and deformities, injuries or disease of the genitals, pelvic exenterations, enterostomies, obviously disfiguring scars or damage to function of the special sensory organs such as ears or eyes. In these cases, psycho-sexual development may be advanced prior to the onset of the disabling condition. As a result, the individual may have a relatively intact concept of himself in an adult sexual society. The person may be able to cope with present conditions because of successful past experiences with the use of verbal and nonverbal sexual communications. However, these diseases or injuries produce dramatic alterations of the body. Many of them are conspicuous. The conspicuousness and abruptness of the change in the body affects body image and may cause the disabled person to withdraw from society or to have major doubts about his adequacy and self-esteem. These changes may coexist with mechanical aspects of the disabilities which, as in the case of Type 1 preadolescent disabilities, seem to make masturbation or coitus difficult, unrewarding or impossible.

Type 4 includes the physical disabilities which are acquired after puberty or during adulthood and which are progressive. This category includes most of the disabilities to which adults fall heir: progressive coronary heart disease, cerebral ischemia, multiple sclerosis, end-stage renal disease, etc. These disabilities have an effect not only upon the patient but also upon the sexual partner. The sexual partner may be hesitant or unwilling to risk exercising his or her sexuality under the mistaken belief that to do so might jeopardize the health of the disabled person. Conversely, the disabled person may come to use the disability as an excuse for rapidly filling out his or her sexual life now rather than losing out later on. Another possibility is that the person so disabled and living within a marriage relationship may find it virtually impossible to find a stable point which lasts long enough for the marriage partners to solidify their relationship. The couple may find it necessary to constantly adapt to the progressive losses which may eventually overwhelm them. End-stage renal disease or the advanced stages of diabetes mellitus are examples of this type of disability. Not only does the patient have to cope with a deteriorating body but also with the possibility of surgical interventions, such as amputations, nephrectomy, dialysis or blindness. Heaped on top of this, one could expect the consequences of chronic disease, such as fatigue, weight loss, anorexia and loss of libido. Some of these disabilities are conspicuous and therefore make the patient vulnerable to the stigmata of being different from other people. Other disabilities may limit the patient's ability to use masturbation as a sexual outlet, make coitus difficult or impossible or even impede fertility.

In addition to the basic impact of physical disabilities upon sexuality, the physician should be aware of the potential effect of drugs used in the treatment of diseases or disabilities. Some drugs used to treat hypertension have distinct effects upon the erectile capabilities of the male. Others have an apparent affect upon libido for men and women, prednisone being a drug so suspected. Still other drugs used to control the growth of breast or prostatic carcinomas may produce changes in body habitus which are not only disquieting to the patient and the sexual partner but possibly destructive to the self-image which is a basic foundation of a satisfactory sexual adjustment.

Risks and Opportunities

The physician can recognize that working with disabled patients in these areas has a potential for producing concerns and problems as well as benefits. Certainly the physician may find it necessary to spend time and energy developing the awarenesses and skills which will make it possible to help patients with their sexuality. The physician may have to repeatedly convince himself that this is an important and appropriate area for him to work in until such time that he becomes competent enough to integrate them smoothly into his daily medical practice. Through all of this, there remains the possibility that the physician who investigates his patient's sexual life may risk disapproval and misunderstanding by the patient's family or even his professional colleagues.

On the other hand, the opportunities which accrue to the patient and the physician outweigh the risks. The physician will have the satisfaction of knowing that he is dealing with real health problems and concerns that exist in a great percentage of his patients, problems which he and his colleagues may have heretofore overlooked. The physician may also discover that his rapport with his patient may increase dramatically when it becomes clear that one of the most important inner needs, previously neglected, is now being dealt with in a manner which gives the patient permission to recognize and accept these problems. Of course, recognition and acceptance are the first steps to successful treatment. Furthermore, for many patients a great deal of energy is invested in protecting the ego from the risks of feeling inadequate and rejected. To the extent that a patient and the sexual partner can come to a better understanding of the nature of their own sexualities, as influenced by the disability, less energy has to be invested in maintaining a layer of insulation between feelings and outward behaviors of the patient and his sexual partner. The energy thus saved may be able to be redirected into rehabilitation activities such as work, self-care and self-responsibility which will serve to benefit all concerned.

References

1. Sexual problems in medical practice. Burnap DW, Golden JS. Med Educ 42:673, 1967.
2. A new program of sex education and counseling for spinal cord injured adults and health care professionals. Chilgren RA, Cole TM, Rosenberg PP. Int J Paraplegia 11:111 (Aug) 1973.
3. Sexual activity in the post-coronary patient. Hellerstein HK, Friedman EH. Arch Intern Med 125:987, 1970.
4. Total Management of the Arthritic Patient. (Editor: Ehrlich GE) J. B. Lippincott Co., Philadelphia 1973.
5. Sexual attitude reassessment: a training seminar for health professionals. Held JP, Counoyer CR, Held CA, Chilgren RA. Minn Med 57:925 (Nov) 1974.
6. Why sex education for medical students? In Human Sexuality: a health practitioner's text. Ebert RK. Lief HI. (Editor: Green R). Williams and Wilkins, Baltimore 1975.
7. Sexual activity and the spinal cord injured. In Human Sexuality: A Health Practitioner's Text. Cole TM. (Editor: Green R) Williams and Wilkins, Baltimore 1975.

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Also for the treatment of documented *Pneumocystis carinii* pneumonitis. To date, this drug has been tested only in patients 9 months to 16 years of age who were immunosuppressed by cancer therapy.

The recommended quantitative disc susceptibility method (*Federal Register, 37*:20527-20529, 1972) may be used to estimate bacterial susceptibility to Bactrim. A laboratory report of "Susceptible to trimethoprim-sulfamethoxazole" indicates an infection likely to respond to Bactrim therapy. If infection is confined to the urine, "Intermediate susceptibility" also indicates a likely response. "Resistant" indicates that response is unlikely.

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Warnings: Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hematopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

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Dosage: Not recommended for infants less than two months of age.

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Recommended dosage for children—8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, in two divided doses for 10 days. A guide follows:

Children two months of age or older

Weight		Dose—every 12 hours	
lbs	kgs	Teaspoonfuls	Tablets
20	9	1 teasp. (5 ml)	½ tablet
40	18	2 teasp. (10 ml)	1 tablet
60	27	3 teasp. (15 ml)	1½ tablets
80	36	4 teasp. (20 ml)	2 tablets or 1 DS tablet

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***Usage in Pregnancy:* Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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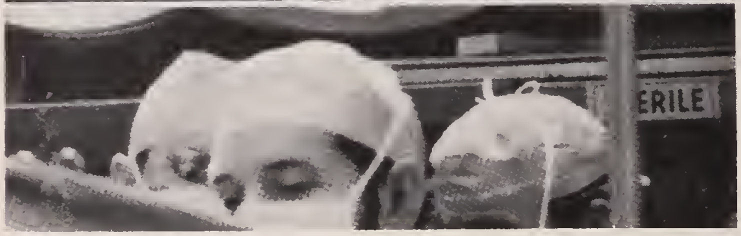

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Professional Liability

What is the status of the physician in Minnesota today as it relates to professional liability coverage? Do we have a crisis, or merely a problem? I submit that it continues to be a serious problem, but certainly not in the crisis proportions as experienced in other states in recent years.

Clearly, physicians in Minnesota do have coverage readily available at rates well below those found in most other states in the country. While the move to claims made coverage a few years ago by the St. Paul Companies created scheduled annual increases in rates over the first five years, those increases have been less than anticipated both last year and for the coming year. What this means is that physicians will experience a scheduled increase this year, but less than was anticipated because of favorable experiences by the St. Paul Companies during the past two years.

The "critical" climate has subsided somewhat nationally and in Minnesota. The public seems less prone to file professional liability suits. We have seen physicians in some parts of the country fighting back with countersuits with a surprising degree of success. This "man bites dog" turn of events has given the public and attorneys some cause to be more prudent in the filing of suits. Whatever reasons for a reduction in pressure throughout the country, it is a welcome trend.

Professional liability as it relates to physicians is a multifaceted problem, and in the end, whatever solutions are brought to the situation will involve a variety of approaches.

During the past few years, all of us have had to learn a new vocabulary of insurance terminology. One doesn't even begin to understand the problem, much less discuss solutions until a working knowledge of insurance terms and procedures are achieved. A few years ago, who would have cared what IBR (incurred but not reported) has to do with our professional liability insurance premium. Or the difference between occurrence policies and claims made. Or why we should be concerned about supporting, as we did, the successful enactment of a joint underwriting bill in the 1976 Legislature. Truly, the physician who thinks he has the solution better make certain that he is fully versed on the complex problem represented by these terms and many, many others.

Unfortunately, in my opinion, the medical profession has attacked the professional liability problem more with an emotional thrust than a well thought out program. As physicians we have been trained to examine carefully the cause of illness before treatment. In the case of professional liability, I am afraid that too many of us have begun to find methods of treatment before we are absolutely certain of the cause or causes.

Throughout the nation, a variety of states have tried a number of treatments. Tort liability reform has been the major effort in most states with perhaps the states of Indiana and Ohio taking the lead in this area. At this point in time, approximately 40 states have enacted something like 400 separate pieces of tort liability legislation during the past two years. However, the frustrating aspect of this is that in no case that I am aware, have insurance carriers decreased rates or made corporate decisions to come back into a market in those states where significant tort liability reform has been enacted by legislatures. Your Minnesota State Medical Association does have a package of tort liability bills before the Minnesota Legislature and I invite you to write to our office for detailed information on what I consider to be an excellent series of bills.

There are other steps which are available to the physician through his state medical association in attacking the professional liability problem. Arbitration panels have been one approach which while authorized in the seven county metropolitan area, have not really been fully utilized, so the jury is still out on whether or not this approach is a viable alternative to the court room. I might add, that the jury is out on this issue, not only in Minnesota, but throughout the nation.

The establishment of a professional liability insurance company by the State Medical Association is another avenue which has been considered by us and certainly has been put in place by a number of states around the country where insurance has become unavailable from private carriers. We have not reached the point of crisis requiring our own profession to self insure ourselves, but it is an option that will continue to be considered by your Association if the climate here in Minnesota begins to approach ''crisis'' proportions.

Increasingly, the concept of risk management is being called the best potential solution to the professional liability problem. Risk management is a program designed to seek out potential hazards that might contribute to the filing of a suit. Those hazards can be of many types. It may be a faulty piece of equipment in the operating room or it may be a multitude of other procedures in the hospital which might potentially contribute to an untoward event leading to the filing of a suit. 80% of all suits have their origin in the hospital setting. However, there is another 20% that have their direct origin in the physician's office. Hence, risk management reaches into the physician's office as well as the hospital to seek out hazards.

In addition, I have long felt that while 80% of the suits do occur as a result of a situation in the hospital setting, many of those suits were filed because the climate of understanding between the patient and physician got off to a bad start in the physician's office. That bad start often occurs not because of what the physician does or doesn't do, but what his office nurse does in the way in which she handles the flow of patients or how the receptionist communicates with patients over the telephone and in the patient waiting room. While this is an over simplification, it is still true that you don't sue your friend.

The Minnesota State Medical Association is working with the St. Paul Companies and others to develop a packaged risk management seminar program which might be given to physicians and physician office personnel throughout the state of Minnesota with the ultimate objective of reducing the risk of malpractice suits. This program, if successful, will cover both the hospital and the physician's office and will represent a unique project for us in Minnesota. While risk management programs have been developed for the hospital, no one has designed a process. I will be reporting to you in subsequent issues of MINNESOTA MEDICINE on our progress on this most exciting project.

C. A. Anderson, M.D.
President

Socio-Economic Conference

The Second Annual Socio-Economic Conference of the Minnesota State Medical Association will be held at the Radisson South Hotel in Bloomington November 17-18.

The Socio-Economic Conference will immediately precede the 1977 Interim Session of the MSMA House of Delegates. The House meeting also is scheduled at the Radisson South, November 18-19.

Editor's Notebook

Three Bedfellows

> "As thick as three in a bed."
>
> Sir Walter Scott
> *The Monastery*

As I put this issue to bed, I direct your attention to three of its authors: (1) Doctor Richard Frey, Chairman of the Health Care Cost Commission, whose opening address to that Commission appears on page 563; (2) Doctor George Martin, Minnesota AMA Delegate, whose interview is on page 569; and (3) Joseph Califano, HEW Secretary, whose remarks before the AMA convention are on page 601.

Strange bedfellows? Yes. And I'm sure Doctors Frey and Martin are as surprised as you to find the company they are keeping. But I have reasons for publishing Califano's remarks. I shall get to them before I end this bedtime story.

Doctor Frey and the Health Care Cost Commission

In his presentation Doctor Frey explains why the Minnesota State Medical Association's Board of Trustees has established a Commission to study health care inflation. This will be the first of a series by Doctor Frey. Follow his reports closely, for the reports will give you insight into how the outside world views medicine.

This background reading may help you understand the central issues.

First, a paper bound book: *The Complex Puzzle of Rising Health Care Costs–Can the Private Sector Put it Together?*[1]

The book summarizes 1976 hearings of the Council on Wage and Price Stability in New York, Chicago, San Francisco, Philadelphia, Houston, and Miami. William Lilley and James Hedlund, Director and Acting Deputy Director of the Council, preface the book by concluding that government efforts to control cost have raised costs rather than cut them. The Directors feel the private sector can best cut costs, but the job will take new ideas and new steps. The book ends with a compendium of 113 new programs employers or unions have started to control costs of health care benefits.

Second, an article: "Controlling Health Care Costs: Strengthening the Private Sector's Hand".[2]

Its author is Clark Havighurst, Professor of Law at Duke University and Director of Duke's Program on Legal Issues in Health Care. In general, Havighurst argues private sector controls are more likely to be effective and appropriate than government controls. In particular, for private sector controls he recommends coverage limitations, exclusion of nonessential care, and wider use of fixed indemnity payments, or negotiated fees and charges, rather than usual and customary fees or incurred costs. A "rediscovery" of the free market and private decision making, he feels, are the most reasonable ways to restore provider accountability and fiscal prudence.

If you want to get either the article or the book, write or call Doctor Elaine Nye at MINNESOTA MEDICINE. She will tell you where to obtain them.

Doctor Martin and His Interview

As you read Doctor Martin's interview, keep in mind it took place one day after the AMA Convention in late June. We wanted to talk to him when the convention was fresh in mind. Also we were striving to step up the gathering and printing of news for MINNESOTA MEDICINE.

The interview appears in print five weeks after the convention. Slow as that may seem to you, it represents lightning speed for a monthly medical journal. At the NEW ENGLAND JOURNAL OF MEDICINE, a weekly publication, the lag period between submitting articles and publishing them takes five months;[3] even editorials, Letters to the Editor, and recurring features take two to six weeks.[4] Between beginning an investigation and publishing its results take 25 months in physical sciences, 30 months in social sciences, and 47 months in medical sciences.[5-6] Note that medical publication is the slowest.

Yet, though the medical publication process moves with glacial speed, medicine is big news. General medical journals compete for news with the lay press and medical giveaways and throwaways.

How do you responsibly speed up publication of new ideas, new studies and new news?

We have adopted the interview idea. The interviewee can tell you quickly and naturally what's on his mind; he doesn't suffer from writer's block; he doesn't have to suffer through the tortures of composing and rewriting; and he gets his ideas across. Strictly scientific material doesn't lend itself to this approach. But medical politics, economics, and social affairs do.

Another way to get your ideas, facts, and comments into print quickly is through Letters to the Editor. British medical journals, or scientific publications such as SCIENCE or NATURE, have lively Letters to the Editors Sections. In Letters to the Editor, you can be as scientific (or as controversial) as you wish, documenting your evidence with tables, graphs, and references, or letting your opinions fly.

In his retirement message to the Massachusetts Medical Society, Editor Franz Ingelfinger of the NEW ENGLAND JOURNAL notes his publication in 1976 published 1337 Letters to the Editor, a new record.[4] Publishing letters, he notes, is a powerful way of increasing the news worthiness of a publication.

To sum up, read our interviews for recent news in the medical, social, and political sphere; and submit Letters to the Editor to break into print faster.

Secretary Califano and his AMA Address

You will agree, I trust, that printing the remarks of an intellectual adversary satisfies the doctrines of fairness, broadmindedness, and general interest. After reading what he has to say, you will agree, too, that Secretary Califano has a gift for clear expression and for making his position unmistakably clear. And lastly, you will probably agree you disagree with Califano.

But I don't want to prejudge or prejudice how you interpret what Secretary Califano says. I do think, however, it may help to know a little of his background before you plunge into his address. His biography reads like this:

Joseph Anthony Califano, Jr.

Born in Brooklyn in 1931, lives in Washington, D.C. Has 3 children
Received B.A.—Holy Cross, Winsted, Mass., 1952
LLB—Magna cum Laude—Harvard Law School in 1955
Navy Ensign in the Office of Judge Advocate in 1955
Joined a law firm in New York in 1961
Became Special Assistant to the General Counsel of the Department of Defense in 1961

Appointed Special Assistant to the Secretary of the Army in 1962
Was General Counsel of Department of the Navy in 1963
Assumed the position of Special Assistant to the Secretary and Deputy Secretary of Defense in 1964
Appointed Special Assistant to President Lyndon Johnson in 1965
Was a member of the Arnold and Porter Law Firm in Washington, D.C. from 1969-71
Became a partner in the firm Williams, Connolly & Califano, Washington, D.C. in 1971
Served as General Counsel for the Democratic National Committee 1970-1972
Is a member of the Board of Directors of Children's Hospital in Washington, D.C.
Wrote: Student Revolution in 1969 and the Presidential National Election later.

Califano was once described as the "Deputy President of the Great Society". He helped dream up programs such as the Model Cities Program and the Office of Economic Opportunity and is reputed to be "an empire builder with an abstract concern for the disadvantaged."[7] Califano himself does not fall into the disadvantaged category, having earned $505,490 from his law partnership the year before assuming the HEW job.[8] He is a strong leader with a managerial bent. Recently he completely reorganized the structure of HEW. Whether he can reorganize American Medicine remains to be seen.

Richard L Reece MD

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*As we go to press, we have received permission from the AMA to publish Dr. James Sammons' reply to Secretary Califano's remarks, page 605

References

1 The complex puzzle of rising health care costs: can the private sector put it together?. Executive Office of the President, Council on Wage and Price Stability, December 1976, Washington, D.C. 20506.
2 Havighurst, CC: Controlling health care costs, strengthening the private sector's hand. Journal of Health Politics, Policy and Law, V 1:4 (winter 1977): 471-498, 1977.
3. Ingelfinger, FJ: Shattuck lecture—the general medical journal: for readers or repositories?. N Engl J Med 296:1258-1264, 1977.
4. Ingelfinger, FJ: New Engl J of Med Editor's Report, 1967-1977, 296:1530-1535, 1977.
5. Roland, CG, Kirkpatrick RA: Time lapse between hypothesis and publication in the medical sciences, N Engl J Med 292:1273-1276, 1975.
6. Garvey WD, Lin, N, Nelson, CE: Communication in the physical and the social sciences: the process of disseminating and assimilating information differ in these two groups of sciences. Science 170:1166-1173, 1970.
7. Time: Into the Snake Pit, pages 43-44, January 3, 1977.
8. Newsweek: A peek in the wallet, page 21, May 7, 1977.

Cover Painting

"Summer Mirage"

Dr. Robert O. Fisch painted the cover picture in the summer of 1976. It is an oil painting. It was painted at Hill City, Minnesota, during a University of Minnesota landscape painting course. He told the editor that the painting was influenced by his daughter, Rebecca, who sees the world as a colorful fairyland.

Dr. Fisch is an Associate Professor in the Department of Pediatrics, University of Minnesota Medical School, and has as his hobbies painting and photography. He has studied art at the Academy of Fine Arts in Budapest, the Walker Art Center in Minneapolis, the University of Minnesota, and the Minneapolis College of Art and Design. His works have been exhibited in various one-man and group shows. He received Honor Awards for the best cover published in MINNESOTA MEDICINE in 1975.

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Single Drug and Combination Chemotherapy in the Treatment
Disseminated Malignant Melanoma

GERARD V. ARANHA, M.D. and THEODOR B. GRAGE, M.D.

A total of 270 patients with metastatic malignant melanoma entered into one of four treatment arms in a controlled, randomized study conducted by the Central Oncology Group Program over a period of two years, using imidazole carboxamide, BCNU, CCNU, vincristine and hydroxyurea, are discussed. There was no statistically significant difference in response among four treatment arms. The overall response rate was 17.3% in all evaluable cases. However, it was 35% in those patients who received some degree of bone marrow toxicity.

THE INCIDENCE AND mortality rates from malignant melanoma appear to be rising throughout the world and yet the tumor is a relatively uncommon neoplasm. The American Cancer Society estimates approximately 9,300 new cases of malignant melanoma to occur in 1976 in the U.S.A., of which 4,400 are estimated to occur in males and 4,900 in females, with approximately 5,000 deaths from this disease for 1976.[1] Approximately 20% of the patients when first seen already have evidence of disseminated disease, with a five year survival rate in this group of less than 5%. The overall crude five year survival in a cumulative series of 3,429 cases from the United States was 37.5%.[2] In nearly all series women have a better survival than men. In a recent review of some 1,187 patients with cutaneous melanoma treated in Queensland, Australia the age adjusted cumulative five year survival rates were 81.6% for both sexes. This astonishingly good result is believed to be due to an intense educational campaign for both the public and the physicians, leading to the diagnosis at a much earlier biological stage.[3]

The response rate of disseminated malignant melanoma to single agent chemotherapy had been discouragingly low until the addition of (5-3-dimethyl-1-triazeno) imidazole 4-carboxamide (NSC 45388 — DTIC). The reported response rates to single agent chemotherapy with drugs such as vincristine, hydroxyurea, cytoxan, cytosine arabinoside, has been reported to range between 5 to 15%, however, such successes have to be judged against the variable clinical course that this malignancy may take and the fact that they usually were performed in small controlled non-randomized clinical trials. Furthermore, the definition of an objective response rate has varied and observed regressions have primarily occurred in cutaneous or nodal metastases. Visceral metastases respond rarely and a clinically useful benefit is usually not observed with these single agents.

Imidazole carboxamide (DTIC) has been extensively tested against malignant melanoma and the drug has shown to be significantly active with an overall response rate of about 20 to 25%, which has been rather consistent for many trials by various clinical cooperative groups. DTIC appears to be an antimetabolite, competitive with 5-amino-immidazo-4 carboxamide, a precursor in the de novo synthesis of purine. Although its exact mechanism of action is uncertain, it also appears to behave as an alkylating agent. Its major toxicity is related to the gastrointestinal tract and the bone marrow. Moderately severe nausea and vomiting are almost invariably seen on the first day of drug administration and tends to improve with subsequent injections of the drug. Bone marrow toxicity is characterized by leukopenia and thrombocytopenia, which usually reaches its nadir at about the 21st day. In Central Oncology Group Phase I and Phase II studies with doses as high as 4.5 mg/kg intravenously daily for periods of ten days, only one drug related death occurred in some 506 patients.[4]

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*Department of Surgery, University of Minnesota Health Sciences Center, Minneapolis, Minnesota.

Supported by: USPHS Grants # CA 12282, # CA 12271, and # CA 08832 from the National Cancer Institute, Public Health Service.

BCNU (NSC 409962) and CCNU (NSC 79037) are moderately effective single agents in the treatment of disseminated malignant melanoma. BCNU inhibits DNA synthesis in the S phase by interfering with the de novo synthesis of purine ribonucleotides.[5] As single agents the nitrosoureas have resulted in objective response rates ranging between 15% to 20%. The nitrosoureas are particularly attractive in the management of patients with disseminated malignant melanoma because of their capability of crossing the blood-brain barrier, since the central nervous system is one of the most common sites for metastases.

From 1972 to 1974 the Central Oncology Group performed a prospectively randomized study using four different treatment programs in the treatment of patients with metastatic malignant melanoma to determine if combination chemotherapy could result in an improved response rate over single agent chemotherapy with DTIC alone[6] (Table 1). The different drugs and combinations were selected because of differences in mechanism of actions, ease of administration and variations in time and type of toxicity. The University of Minnesota Surgical Oncology Service contributed 21 patients to this study in which a total of 243 evaluable patients were treated with one of the four treatment programs.

TABLE I
Four Regimens for Metastatic Malignant Melanoma

Therapy I	**DTIC alone at a dose of 4.5 mg/kg I.V. daily for 10 days**
Therapy II	**DTIC 2.7 mg/kg I.V. on day one to day five** **CCNU 2.0 mg/kg p.o. on day two** **Vincristine 0.027 mg/kg I.V. on day one and day five (maximum single dose not to exceed 2.5 mg)**
Therapy III	**DTIC 2.7 mg/kg I.V. from day one through day five** **BCNU 2.0 mg/kg I.V. on day two** **Vincristine 0.027 mg/kg I.V. on days one and five (maximum single dose not to exceed 2.5 mg)**
Therapy IV	**DTIC 2.7 mg/kg I.V. from day one through day five** **BCNU 2.0 mg/kg I.V. on day two** **Hydroxyurea 30 mg/kg p.o. two times/ week for 3 weeks**

Note: All of the above based on the lesser of the actual or ideal body weight.

It is the purpose of this report to present a brief summary of the results of these four treatment programs and to illustrate this study by means of a case report of one of the four of 21 patients responding at the University of Minnesota Hospitals.

Case Report

This 58-year-old man was admitted to the University of Minnesota Hospitals in December of 1974 with a history of an amputation of the right fourth toe in January of 1970 for an ulcerating malignant melanoma of the plantar surface. Clinical evaluation at the time of this admission revealed evidence of widespread metastatic malignant disease in the lungs, liver, subcutaneous tissue and inguinal lymph nodes. The right inguinal area contained a cluster of four masses measuring from 3.5 x 3.5 in diameter to 1.5 to 1.5 in diameter. The liver was markedly enlarged with a palpable margin 5 cm below the right costal margin. The left infra-scapular area contained a 1.5 cm subcutaneous nodule and a similar nodule had been removed from the left anterior chest wall, revealing evidence of metastatic malignant melanoma.

Laboratory and Radiological Data

The peripheral blood picture was within normal limits. Liver function studies revealed an elevation of the alkaline phosphatase to 280 I.U. (normal 50 to 220 I.U.). The remainder of the liver function studies and coagulation profile were within normal limits.

A chest Xray, taken on December 12, 1974 showed multiple bilateral pulmonary nodules of varying sizes and a left hilar mass (Figure 1).

A liver scan taken on this admission showed multiple defects in the liver, consistent with multiple metastases (Figure 2).

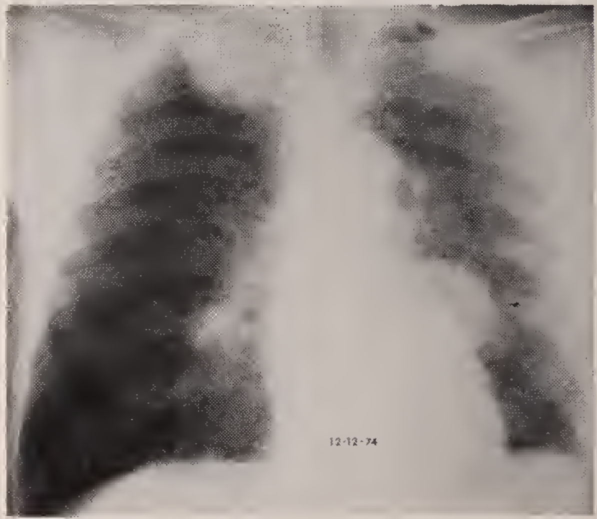

Fig. 1—Chest Xray (12/12/74) showing multiple metastatic nodules in both lungs.

Treatment

The patient was randomized to receive Treatment 2, which consisted of DTIC 2.7 mg/kg intravenously, daily, for five days, a single dose of CCNU 2.0 mg/kg orally on day two, vincristine 0.027 mg/kg intravenously on day one and day five.

Evidence of clinical benefit was apparent within two months of onset of therapy and the patient has received repeated courses of this regime at two month intervals, the most recent course being administered in April 1977. Within five months after onset of therapy there was a remarkable decrease in the size of the left hilar mass and complete disappearance of the mass in the right lower lobe and of the mass in the apex of the right lung (Figure 3). The most recent chest Xray from April 1977 reveals no abnormalities. Similarly, there was decrease in the size of the multiple defects in the liver within a few months after onset of therapy (Figure 4). The most recent liver scan is normal. The subcutaneous metastases in the left infra-scapular area have disappeared. Of the four masses in the right groin only one mass, measuring approximately 2 x 2 cm in diameter is the only clinical evidence of residual disease. This objective regression was accompanied by a good clinical result in that the patient's appetite returned to normal, he regained his weight and is essentially asymptomatic.

Tolerance to the drug regime has been good with mild to moderate degrees of leukopenia and thrombocytopenia following each course of drug administration and a fair degree of nausea and vomiting with the onset of chemotherapy, poorly controlled by anti-emetics. The gastrointestinal toxicity usually subsides within a day of completion of chemotherapy.

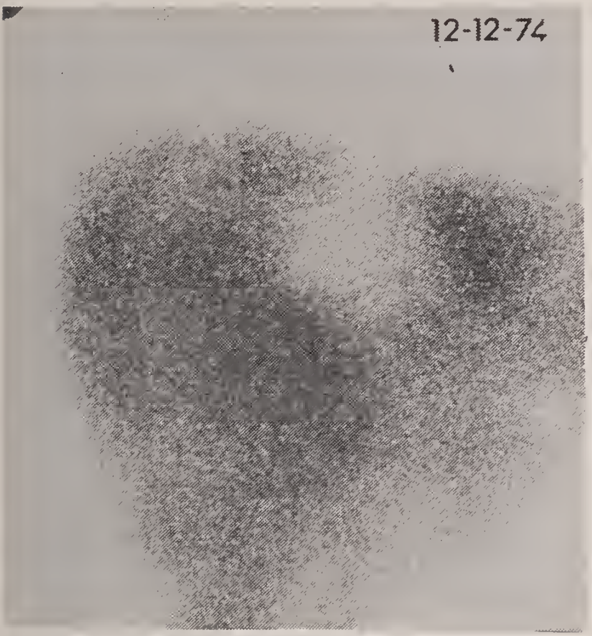

Fig. 2—Liver scan (12/12/74) showing multiple filling defects.

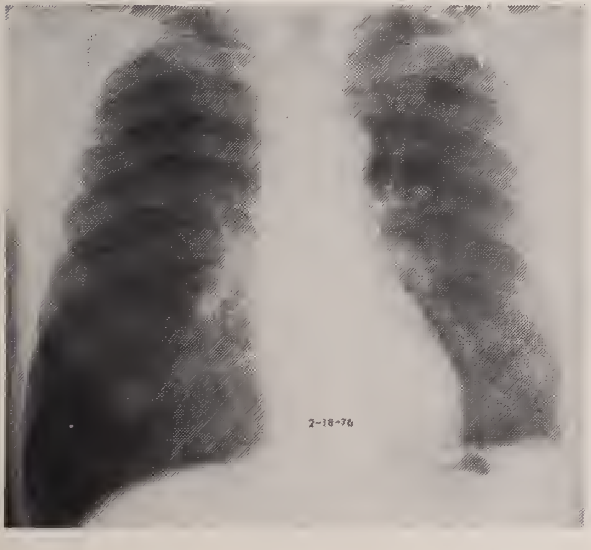

Fig. 3—Chest Xray (2/18/76) showing complete disappearance of multiple metastatic nodules in both lungs.

The future plans for this man include continuing the administration of the drugs at the present dose level at two month intervals.

COG Study 7130

Materials and Methods

Patients with measurable metastatic malignant melanoma or uncontrollable regional disease who could not be treated by other measures were eligible for entry into this study. With the exception of DTIC, patients who had been treated with agents employed in this study, either systemically or regionally were ineligible. Patients who had received radiation therapy exceeding 3000 rads to the pelvis or lumbar spine, or had been treated with chemotherapy within the preceding 30 days were not eligible for entry. All eligible patients were randomized to one of four treatment regimes, indicated in Table 1. Patients who had previously received DTIC alone initially were eligible to receive one of the combination therapies following progression on DTIC. The criteria for response were as follows, with a minimum of six weeks being the minimum adequate trial:

Complete Response (CR): Disappearance of all objective and subjective evidence of tumor

Partial Response (PR): Decrease of 50% or more in product of the diameter of the lesions measured or 20% in number of lesions being counted. For patients with hepatic metastases a 50% decrease in liver size and/or a 50% improvement in liver function profile.

No Change (NC): Increase or decrease of less than

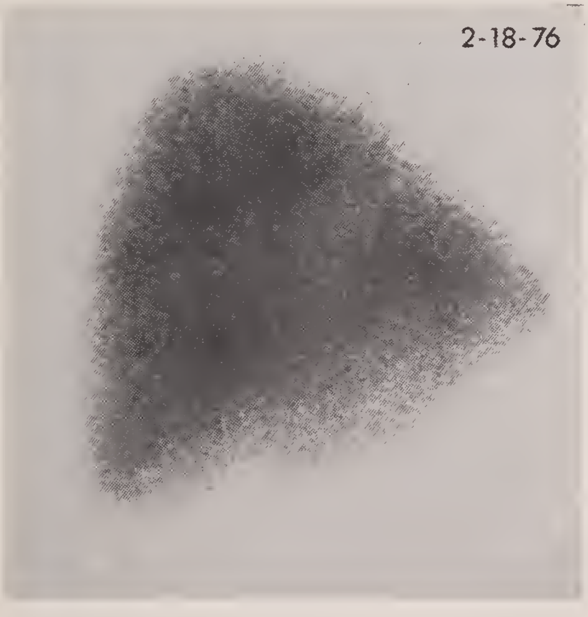

Fig. 4—Liver scan (2/18/76) showing no filling defects and even distribution of contrast.

50% of the product of the diameter of measurable lesions and no more than 10% change in numbers of lesions being counted.

Progression (P): 50% or more increase in the product of the diameter of lesions or appearance of new lesions or more than 10% increase in lesions being counted. In patients with hepatic involvement — 50% increase in liver size and/or a 50% shift to abnormal in liver function profile.

In addition to response, all patients were evaluated for length of survival and for toxicity. Toxicity parameters included nausea, vomiting, leukopenia, thrombocytopenia and neurotoxicity, with Grades III and IV being most severe, white count less than 2000 or platelets less than 75,000.*

To insure even distribution of cases to one of four treatment arms, prior to the randomization procedures, patients were stratified by:

1. Previous treatment
2. Stage (Stage II regional disease, Stage III systemic disease)
3. Organ involvement.

Survival curves were calculated by the method of Kaplan and Meier.[7] Differences in response rate were tested by the Chi-square test and duration of response and survival curves were calculated by Gehan's modification of the Wilcoxon test.[8,9]

Results

A total of 270 patients were entered into the study of which 243 were considered evaluable (90%). Two hundred and twelve patients had received no prior DTIC therapy and 31 patients had been previously treated with DTIC. The 27 unevaluable patients were excluded for one or more of the following reasons: Deaths prior to the end of six weeks trial period, lost to follow-up or incomplete follow-up. There were eight deaths within 21 days after initiation of therapy due either to intra-cerebral hemorrhage from metastatic tumor or to progression of the disease. No deaths occurred from drug toxicity. Toxicity in the form of nausea and vomiting were experienced by nearly all of the patients on all of the arms, usually of mild to moderate severity and most severe on the first to third day of drug therapy. Thirty-five percent of the patients on the DTIC arm alone experienced some degree of leukopenia and 50% of the patients on the combination arms. The nadir of the bone marrow depression on the combination arms was between the 40th to 45th day after onset of therapy. The white blood cell count dropped to below 2000 in only two patients and in no patients did it go below 1000. Other toxicities included mild neurotoxicity in 21 of the patients treated with vincristine and alopecia was experienced by two patients.

Response

Table 2 presents a summary of all evaluable patients by treatment in percentages. On Treatment I, DTIC alone, eight of 48 patients responded with three complete responses, a rate of 16%. On Treatment II, eleven of 66 patients responded, with two complete responders, a rate of 17%. Fifteen of 64 patients responded on Arm III, a rate of 23% with no complete responders. Eight of 63 patients responded on Arm IV, with three complete responders, a rate of 13%. Responses thus occurred in 42 cases, 15.5% of the 270 study patients and 17.3% of the 243 cases considered to be evaluable.

Median duration of response ranged from 18 weeks on Treatment I to 23 weeks on Treatment II. The difference in duration of responses between the four treatment arms was statistically not significant. It is of interest that of the 31 patients previously treated with DTIC alone there were four partial responders to combination therapy. Neither the sex nor age, nor site of primary tumor influenced the response rate.

When examining response rates by toxicity all of the responders had some toxic signs. Toxic patients with a white count below 4000 had a significantly higher

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*Definition of Toxicity from COG Table.

TABLE 2
Treatment Summary of 243 Evaluable Patients

	CR and PR %	NC %	P %	Total #	 %
Treatment					
I — D	16%	44%	40%	48	100%
II — D.C.V.	17%	40%	43%	67	99%
III — D.B.V.	23%	35%	42%	65	100%
IV — D.B.H.	13%	49%	38%	63	100%
Total	17%	42%	41%	243	100%

See text for definitions of response.

response rate than non-toxic patients on all treatment arms except Treatment IV. In patients with no prior treatment with imidazole carboxamide, leukopenic patients had a 35% response rate compared to an 8% response rate in non-leukopenic patients. When considering all categories of response the difference was significant. ($p>0.001$). In addition to that, leukopenic patients survived longer than non-leukopenic patients with a median survival of 41 weeks vs. 22 weeks ($p>0.002$) (Figure 5).

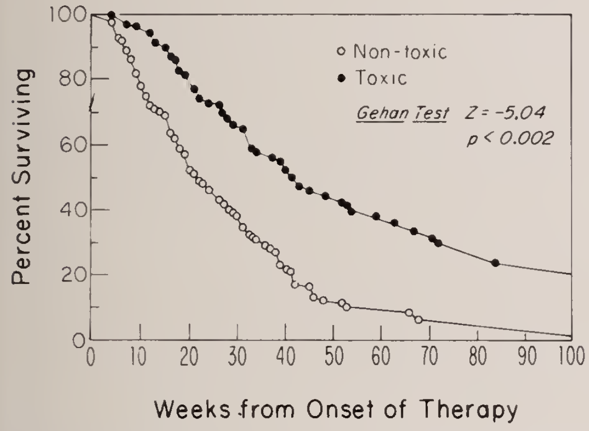

Fig. 5—Melanoma Patients. Survival of Patients Treated to Leukopenia vs. No Leukopenia.

For the entire group there are no significant differences in the survival rates between the four treatment arms (Figure 6). The overall median survival is approximately six months. As a general rule, females had a longer survival time with a median of 34 weeks vs. 22 weeks for males. Also of significance is that the responders survived significantly longer than non-responders (Figure 7).

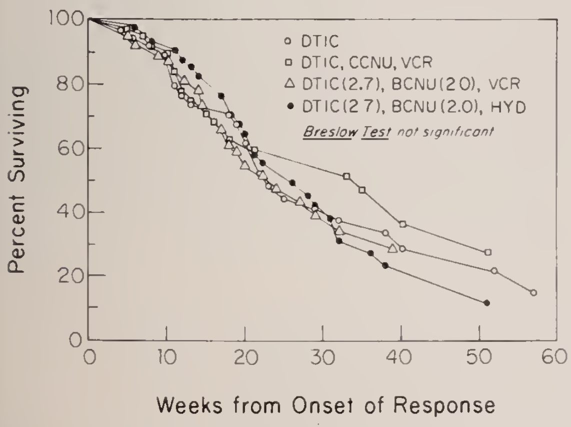

Fig. 6—Melanoma Combinations Group 1. Survival by Treatment.

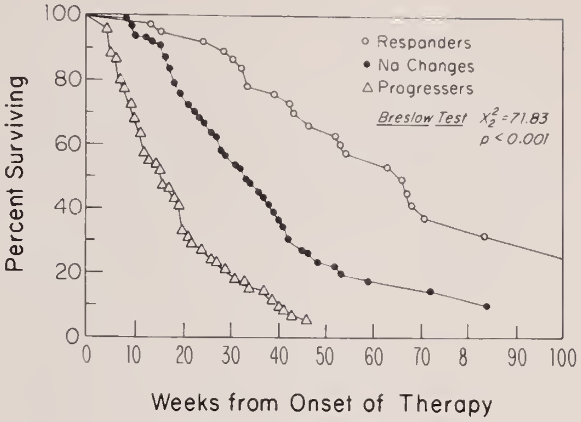

Fig. 7—Melanoma Patients. Survival by Response.

The adverse influence of metastatic disease to the liver or to the central nervous system disease is readily apparent in a shortened survival time as indicated in Figure 8.

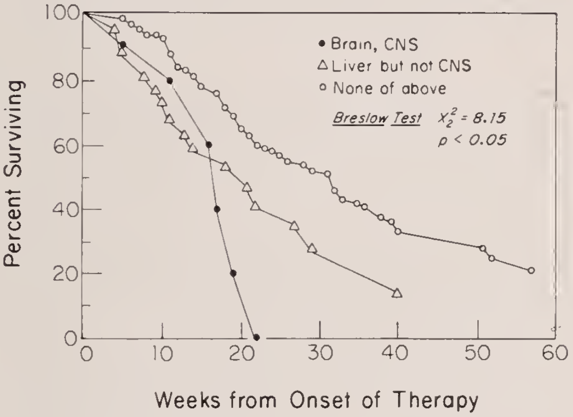

Fig. 8—Melanoma Patients — Survival by Organ Involvement.

Discussion

This investigation failed to reveal any significant advantage to combination chemotherapy over treatment with a single agent, imidazole carboxamide alone. The response rate with DTIC alone or in combination was somewhat less than 20% and there was very little difference in overall response rate between the drug used alone vs. the drug used in combination with one of the nitrosoureas and vincristine or hydroxyurea. It is of interest that failure to respond to DTIC alone does not preclude a subsequent response to a combination that includes imidazole carboxamide. The overall response rate in this study is similar to two other studies, using similar dose schedules which also suggest no significant advantage of combination chemotherapy vs. single agent chemotherapy.[10,11]

The observation that patients treated to toxicity had a response rate of 35% seems to illustrate an important principle which has been noted in other studies. In a study using a combination of BCNU, hydroxyurea and imidazole carboxamide in 89 patients with disseminated malignant melanoma Costanzi et al. noted an overall response rate of 27% using a somewhat higher dosage schedule, resulting in a higher degree of bone marrow toxicity.[12]

On the basis of this experience, a new study by the Central Oncology Group testing combination chemotherapy in the treatment of disseminated malignant melanoma contains an escalation clause. Patients who fail to have evidence of mild leukopenia or thrombocytopenia, drug dosages are escalated by 20% in each subsequent course until evidence of mild to moderate bone marrow toxicity is observed.

Summary

A total of 270 patients with metastatic malignant melanoma have been entered into one of four treatment arms in a controlled, randomized study conducted by the Central Oncology Group program over a period of two years, using imidazole carboxamide, BCNU, CCNU, vincristine and hydroxyurea. There was no statistically significant difference in response rate among the four treatment arms. However, several important observations were made:

1. A 13% response rate was achieved in patients who had previously failed on imidazole carboxamide alone with a combination containing imidazole carboxamide.

2. The overall response rate was 17.3% in all evaluable cases, however, was 35% in those patients who achieved some degree of bone marrow toxicity.

3. Two of the four treatment arms appear to be more advantageous due to ease of administration. These arms are:

I. DTIC, BCNU and vincristine
II. DTIC, CCNU and vincristine

Both are administered in five day courses, every six weeks.

4. Response rates and length of survival were significantly greater in patients without brain or hepatic metastases.

5. The response rate appears to be independent of age, sex, or site of primary lesion.

References

1. Seidman H. Silverberg E. Holleb A: A statistical comparison of black and white populations. CA—A Cancer Journal for Clinicians 26:2. 1976.
2. James AG: Cancer Prognosis Manual. Am Ca Soc 1966.
3. Davis NC: Cutaneous melanoma: the Queensland experience. Curr Prob in Surgery. May, 1976.
4. Wagner DE. Ramirez G. Weiss AJ. Hill G: Combination Phase I-II study of imidazole carboxamide (NSC 45388). Oncology 26:310. 1971.
5. Carter SK. Schabel FM Jr. Broder LE. Johnston TP: 1-3-bis(2-chloroethyl 1-nitrosourea) (BCNU) and other nitrosoureas in cancer treatment—a review. Adv Ca Res 16:273. 1972
6. Carter RD. Krementz ET. Hill GJ. et al.: DTIC and combination therapy for melanoma: I: Studies with DTIC. BCNU. CCNU. vincristine and hydroxyurea. Ca Tr Rep 60:601. May. 1976.
7. Kaplan EL. Meier P: Nonparametric estimation from incomplete observations. J Am Stat Assn 53:457. 1958.
8. Breslow N: A generalized Kruskal-Wallis test for comparing K samples subject to unequal patterns of censorship. Biometrika 57:579. 1970.
9. Klotz J: One-way layout for counts and the exact H test with ties. University of Wisconsin Tech Rep 407. Dept of Statistics. 1975
10. Beretta G. Bajetta E. Tancini G: Controlled study with imidazole carboxamide (DTIC). bis-chlorethyl-nitrosourea (BCNU) and vincristine (VCR) versus actinomycin D (ACT D). DTIC. BCNU in metastatic malignant melanoma. Absts 11th Internatl Cancer Congr. Italy. 541. October. 1974
11 Costanza ME. et al.: Therapy of malignant melanoma with an imidazole carboxamide and bis-chloroethyl nitrosourea Cancer 30:1457. 1972.
12. Costanzi JJ. et al.: Combination chemotherapy for disseminated malignant melanoma Cancer 35:342. 1975
13. Bray D. Oliverio V. Adamson R. DeVita V Cell cycle effects produced by 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea(CCNU) and its decomposition products. Proc Am Assn Ca Res 11:12. 1970.
14. DeVita V. Carbone P. Owens A: Clinical treatment with BCNU. Ca Res 25:1876. 1965.
15. Diangelo JM. Groth DP. Vogeler WR: Effects of 1,3-bis(2-chloroethyl)-1-nitrosourea (BCNU) on purine metabolism. Int Ca Cong abstract #10. Congress 408. 1970.
16. Gerner RE. Moore GE. Dickey C: Combination chemotherapy in disseminated melanoma and other solid tumors in adults. Oncology 31(1):22. 1975.
17. Gubisch N. Norena D. Perlia C: Experience with vincristine in solid tumors. Ca Chem Rep 32:19. 1963.
18. Hellman K: Investigational drugs for the treatment of malignant melanomas. Proceedings of the Royal Society of Medicine 67:100. 1974.
19. Hill G. Ruess R. Beris R. Philpott GW. Parkin P: Chemotherapy of malignant melanoma with dimethyl-triazeno imidazole carboxamide (DTIC) and nitrosourea derivatives (BCNU) (CCNU). Ann Surg 180:167. 1974.
20. McNeer G. DasGupta T: Prognosis in malignant melanoma. Surgery 56:512. 1964.
21. Rochlin DB. Wagner DE. Wilson W. Weber AP: Results of Phase I and Phase II studies with imidazole carboxamide-dimethyl-triazeno. Abstract #768. 10th International Cancer Congress. Houston. 1970.
22. Larsen RR. Hill GJ II: Improved systemic chemotherapy for malignant melanoma. Am J Surg 122:36. 1971.
23 Carter SK. Friedman MA: 5-(3,3-dimethyl-1-triazeno)-imidazole-4-carboxamide (DTIC. DIC. NSC-45388)—a new antitumor agent with activity against malignant melanoma. Europ J Cancer 8:85. 1972
24. Johnson FD. Jacobs EM: Chemotherapy of metastatic malignant melanoma. Cancer 27:1306. 1971.
25 Luce JK. Chemotherapy of malignant melanoma Cancer 20:1604. 1972.

Initial Experience with Metolazone

Well Tolerated New Antihypertensive Agent

THOMAS O. NICHOLS, M.D.*

In 44 patients treated for up to 11 months with single daily doses of the antihypertensive/diuretic metolazone, mean blood pressure declined from 175/92 mmHg to 158/86 mmHg. Only three patients reported side effects, which were of a minor nature. This group represented patients whose blood pressure had been fairly well controlled by other antihypertensive drugs, but the patients had experienced side effects or difficulty in complying with dosage schedules of the previous medications.

METOLAZONE† IS A NEW quinazolinone diuretic that has been reported to be an effective antihypertensive agent with a prolonged duration of action and a low incidence of side effects.[1-5] Its primary mode of actions appears to be inhibition of sodium reabsorption in the cortical diluting segment of the distal renal tubule,[6] but some action in the proximal convoluted tubule has also been reported.[7]

Controlled comparison with chlorthalidone has shown metolazone to be equally effective in single daily doses,[3] and a crossover comparison with hydrochlorothiazide showed that a single daily dose of metolazone 5 mg provided significantly better antihypertensive control than did hydrochlorothiazide 50 mg administered twice a day.[4] Experimental studies have suggested that metolazone causes a relatively greater increase in sodium rather than potassium excretion,[7-9] although this effect has not been demonstrated clinically in hypertensive patients.[4]

The possibility of unusually good tolerance with a medication effective in single daily doses led us to begin introducing metolazone into our treatment of hypertension on a trial basis. While a number of patients were already under adequate control with other medications, problems of side effects due to these drugs or the inconvenience of multiple-dose schedules prompted our early evaluation of this new drug. This paper reviews our initial results with this medication.

Patients and Methods

The records of 50 patients with essential hypertension who had received metolazone were reviewed, and 44 were selected for evaluation. The only reasons for exclusion were insufficient followup or failure to take the prescribed medication. Demographic characteristics of the patient population appear in Table 1.

The 23 males and 21 females who were evaluated included several patients who had not previously received antihypertensive therapy, but almost all had suffered from hypertension for several years and had received a variety of previous medications, such as chlorothiazide, hydrochlorothiazide, polythiazide, chlorthalidone, hydralazine, methyldopa, and reserpine.

At the start of metolazone administration blood pressure averaged 175/92 mmHg. The range in systolic pressure was 126 to 220 mmHg, and in diastolic, 70 to

TABLE 1
Demographic Characteristics

Number of Patients	Age (years)		Weight (lbs)		Initial Mean Blood Pressure (mmHg)	
	range	mean	range	mean	systolic	diastolic
23(M)	27-82	62.3	141-221	180.3	180	93
21(F)	37-86	61.4	101-248	151.4	170	90
Total 44	27-86	61.9	101-248	166.5	175	92

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†Zaroxolyn ®

142 mmHg. At the point at which metolazone therapy was begun, 11 patients had systolic pressure below 160 mmHg, while seven had pressure above 199 mmHg. Eighteen patients had diastolic pressure below 90 mmHg and 10 had diastolic pressure above 109 mmHg.

The most common associated medical problems were obesity, diabetes, and atherosclerotic heart disease, but a variety of other conditions characteristic of a middle-aged and elderly patient population were also represented.

In close to 70% of the patients, the initial dose of metolazone was 5 mg administered once daily. Most of the other patients received an initial dose of 10 mg per day, but 5 patients were directed to take metolazone only on Monday, Wednesday, and Friday of each week.

At the time of this review, only three patients had received the drug for less than one month and 13 had received it for more than eight months. The mean duration of therapy was 5.2 months and the longest period over which the response of any patient was followed was 11 months.

The majority of these patients received metolazone

TABLE 2
Blood Pressure Response of Individual Patients

Patient Number	Sex	Age	Initial Dose (mg)	Blood Pressure at start of Metolazone Therapy	Most Recent Blood Pressure	Duration Metolazone Therapy (months)
01	M	60	10	202/112	172/92	4
02	F	63	10	220/142	104/100	4
03	M	74	10	198/90	122/82	1
04	M	70	5	170/80	194/74	2
05	M	69	5	170/70	160/80	2
06	M	79	5	174/86	162/86	10
07	F	69	5	148/70	160/70	7
08	F	86	5	192/90	186/96	11
09	F	61	5	160/80	146/88	1
10	M	75	10*	172/100	156/86	1
11	M	70	5	190/110	140/90	11
12	M	82	2.5*	190/72	184/72	7
13	M	59	5	190/85	142/60	3
14	M	54	10	215/110	186/118	1
15	M	38	10	180/110	184/106	0.5
16	F	69	5	180/80	160/80	10
17	M	56	10	220/110	210/90	1
18	F	55	5*	136/80	148/104	4
19	M	45	5	146/110	138/104	1
20	M	62	10	160/90	146/80	4
21	F	78	10	200/70	180/68	7
22	F	37	5*	126/90	130/88	1
23	M	78	5	204/72	160/70	9
24	F	64	5	154/70	162/80	11
25	F	58	5	190/110	160/90	3
26	M	69	10	150/100	146/80	3
27	M	57	10	160/94	132/90	0.5
28	M	65	5	174/82	160/80	5
29	M	56	5	176/70	168/80	11
30	M	49	5	192/100	160/84	0.75
31	F	64	5	158/82	166/106	10
32	M	62	5	188/90	166/90	4
33	F	76	5	158/78	150/70	11
34	F	69	5	174/92	140/65	9
35	F	63	2.5*	135/72	155/88	6
36	F	41	5	167/103	130/80	9
37	F	66	5	132/90	160/80	9
38	F	51	5	160/90	146/84	1
39	F	69	5	174/88	146/78	10
40	F	47	5	192/100	134/94	4
41	F	54	5	184/110	130/98	8
42	M	27	5	152/104	136/94	2
43	M	77	5	162/92	168/70	6
44	F	49	10	220/110	210/120	1

*Dosage administered three times a week (Monday, Wednesday, Friday) alone, but of six who were judged to need additional antihypertensive medication, five received hydralazine and one received polythiazide.

Results

Mean blood pressure of the entire group of 44 patients declined from 175/92 mmHg at the start of metolazone therapy to 158/86 at the most recent observation, a mean decline of 10/7%. This change may be considered a substantial decrease for a population that included many patients who had received other antihypertensive agents and had already shown some measure of therapeutic response. Individual blood pressures at the start of metolazone therapy and at the most recent reading are shown in Table 2. Antihypertensive response to metolazone was generally evident at the first return visit, which customarily occurred about three weeks after initiation of therapy.

Diastolic Response

Eighteen patients had diastolic pressure below 90 mmHg when metolazone was started. In this group the mean diastolic pressure rose slightly, from 77 to 80 mmHg during metolazone therapy. The 10 patients with initial diastolic pressure between 90 and 99 mmHg showed a substantial decline in pressure during metolazone therapy, from 91 to 83 mmHg. The group whose mean diastolic pressure showed the sharpest decreases during metolazone treatment consisted of those patients with an initial pressure between 100 and 109 mmHg; the mean pressure dropped from 101 to 86 mmHg, a decrease of 15½. The 10 patients whose initial diastolic pressure had been greater than 109 mmHg had an initial mean of 113 mmHg and a final mean of 100 mmHg, an 11% decrease.

As can be seen from Figure 1, which divides the patients into groups on the basis of the pre- and post-medication diastolic pressure, 37 patients either moved from a higher to a lower pressure group during metolazone therapy or maintained a diastolic pressure below 90 mmHg. Another five patients remained in the same pressure group in which they had been at the start of therapy. During treatment with metolazone only two patients showed a shift to a group with a higher pressure that was not in the normotensive range.

Systolic response

A similar pattern is seen in the response of systolic pressure (Figure 2). At the start of metolazone therapy, 11 patients had pressure below 160 mmHg and 17 had pressure below 170 mmHg. By the time of the final observation of response to metolazone, 22 patients had pressure below 160 mmHg and 35 had pressure below 170 mmHg.

Thirty-five patients either shifted to a lower systolic pressure group during metolazone therapy or remained in a group with a pressure below 160 mmHg. The 25 patients with an initial mean systolic pressure below 180 mmHg experienced a mean drop in systolic pressure of 4.0%, while the 19 patients with systolic pressure of 180 mmHg or more experienced a drop of 17%.

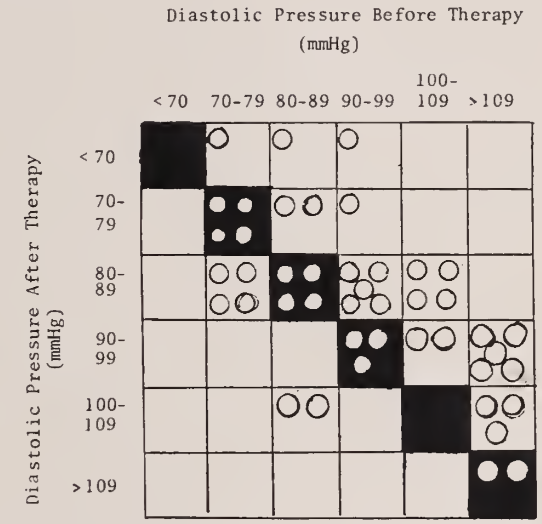

Fig. 1—Diastolic Pressure Before and After Metolazone Therapy. Each circle represents one patient, whose before and after treatment blood pressure can be read from the x and y axes respectively; circles within the shading represent essentially no change, those to the right (the majority) represent improvement, those to the left, an increase.

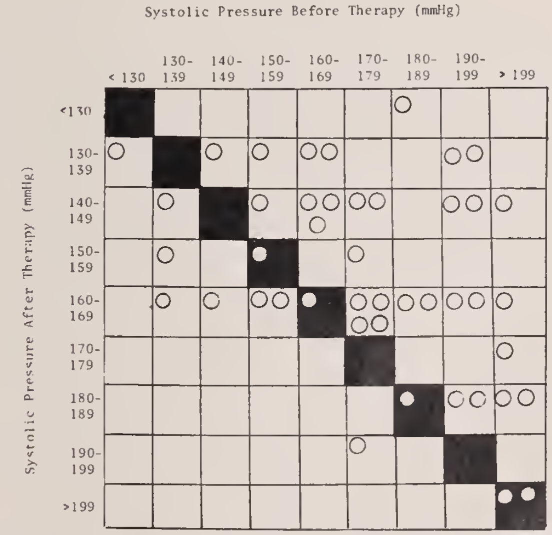

Fig. 2—Systolic Pressure before and after Metolazone Therapy. Each circle represents one patient, whose before and after treatment blood pressure can be read from the x and y axes respectively; circles within the shading represent essentially no change, those to the right (the majority) represent improvement, those to the left, an increase.

Side Effects

Few side effects were observed. One patient who had not previously been treated for hypertension experienced transient dizziness during the second month of therapy while receiving 2.5 mg metolazone daily. A second patient, who was receiving metolazone 5 mg only on Monday, Wednesday and Friday, reported that her mouth "felt like cotton." The only other patient with a possible side effect related to medication was a 69-year-old woman who complained of nocturia, gastrointestinal disturbances, and fatigue.

It is difficult to estimate the incidence of lowered potassium levels associated with metolazone therapy from the results of the present study, since baseline values were not customarily obtained at the start of therapy and since several patients were already receiving potassium supplements when metolazone was prescribed. However, below-normal potassium (<3.5 mEq/1) was initially observed in three patients of the present series while they were receiving metolazone, and a fourth patient who was already receiving potassium supplements, showed further reduction in serum potassium, from 3.8 mEq/1 to 3.4 mEq/1, during five months of metolazone therapy. In no case did hypokalemia constitute a serious clinical problem and normal serum levels were obtained from several patients after more than seven months of metolazone therapy. No other significant laboratory abnormalities were associated with metolazone administration.

Discussion

According to Figure 1, two patients shifted from a normotensive diastolic pressure group to a hypertensive group during therapy. One of these patients was a 64-year-old female who had failed to return for observation for several months before her most recent evaluation; compliance was questionable in this case. The other was a 55-year-old female with a duodenal ulcer. She was the same patient who had complained that her mouth "felt like cotton." Her regimen consisted of metolazone 5 mg taken only three times a week. Although her diastolic pressure remained well controlled for three months after the initiation of metolazone therapy, at the end of four months her pressure had increased to 148/104 mmHg from an initial level of 136/80 mmHg.

Two other patients continued to have diastolic pressures in excess of 110 mmHg at the last point at which blood pressure was measured. One of these suffered from a marked anxiety state as well as alcoholism; compliance may have been a problem with this patient as well. The other patient was an obese 54-year-old man who had a pressure of 215/110 mmHg at the start of treatment with metolazone 10 mg per day. He had been followed for only 1 month up to the time of this review. At the end of that period, his systolic pressure had declined by 29 mmHg, to 186 mmHg, but his diastolic pressure had failed to respond.

One of the patients whose response to metolazone was followed longest was a 70-year-old moderately obese man with gout. His diagnosis had only recently been established, and metolazone was his first antihypertensive medication. At the start of therapy his blood pressure was 190/110 mmHg. After two weeks on a regimen of metolazone 5 mg per day, a pressure of 164/92 mmHg was recorded. It was subsequently considered advisable to increase his daily dose of metolazone to 10 mg, and with this regimen he remained well controlled after 11 months. His most recent pressure was 140/90 mmHg. After 7 months of therapy with metolazone, his serum potassium was 4.4 mEq/1.

Overall, our experience with metolazone has been quite favorable. The incidence of side effects has been so low that we are now routinely using metolazone as our standard diuretic antihypertensive agent: we start newly diagnosed hypertensives on five or 10 mg per day, depending upon the severity of their condition, and switch patients to metolazone from other antihypertensive agents when they experience trouble with side effects or evidence loss of control. If response to metolazone 10 mg is judged inadequate, the addition of hydralazine 25 mg bid has generally proven successful. Very few patients have failed to respond to this regimen, and a welcome simplification of therapeutic options has thus been possible.

Side effects can be a major obstacle to sustained patient adherence to medication schedules for the treatment of hypertension, a condition that is so frequently asymptomatic. Every physician is familiar with the patient who felt better before he or she began therapy. Several of these patients, however, volunteered that they felt appreciably better on metolazone than they had when receiving their previous antihypertensive medication.

Another reason for poor patient compliance can be inconvenient medication schedules. A 60-year-old obese man reported that he greatly appreciated the reduction in the number of daily pills that resulted from the substitution of metolazone. He had been taking a combination tablet of methyldopa 250 mg and hydrochlorothiazide 25 mg four times a day together with spironolactone 25 mg, also four times a day — a total of 8 pills. Both of these medications were discontinued when metolazone 10 mg was prescribed. During the five months that the patient has received metolazone, his blood pressure has fallen from 160/90 to 146/80 mmHg.

One might speculate that in the latter patient an initial "high volume hypertension" had been complicated by another hemodynamic mechanism, such as the renin-aldosterone system, that was activated by progressive volume depletion. However, in the absence of renin measurements this theory must remain speculative. In general, we have not felt that the utility of renin measurements in patients with primary essential hypertension justifies the considerable inconvenience and cost of obtaining reliable values, an opinion that appears to be increasingly widespread.[10]

No direct comparison with other standard antihypertensive agents such as chlorothiazide was attempted in the present study. However, the percentage of patients showing therapeutic response to metolazone was clearly comparable to the best results obtained with standard diuretics, a conclusion that is in accordance with the results of direct comparative studies.[3,4] With respect to the relative incidence of hypokalemia, again the present study does not permit any explicit comparisons to be drawn, although the incidence did appear relatively low — a result that has been predicted on theoretical and experimental grounds,[7-9] but which has not been observed in previous clinical trials.[4]

A moderate diuretic effect was observed during metolazone therapy in some patients. When further diuresis was desired the addition of furosemide proved effective.

Summary

Metolazone was administered alone to 38 patients or with another antihypertensive drug to six patients, all with essential hypertension, for a mean duration of five months. Thirty-seven patients either moved from a higher to a lower pressure group during therapy or continued to show a diastolic pressure below 90 mmHg. Three other patients whose diastolic pressure initially was below 100 mmHg stayed below that level during therapy. The four remaining patients had not yet responded adequately after short trial periods on the drug. Mean blood pressure declined from 180/93 mmHg at the start of metolazone therapy to 158/86 mmHg at the most recent observation.

Only three patients (7.5%) reported possibly drug related side effects: transient dizziness, dry mouth, and gastric disturbance combined with fatigue. Several cases of lowered potassium were observed, but there was no evidence of clinically significant hypokalemia.

Metolazone appears to be a safe and extremely well tolerated diuretic/antihypertensive that is equally appropriate for initial therapy of essential hypertension, substitution for other antihypertensive agents when problems of compliance or intolerance are encountered, and combination with other drugs when required for more refractory cases.

References

1. Pilewski RM, Scheib ET, Misage JR, Kessler E, Kritcher E and Shapiro AP: Technique of controlled drug assay in hypertension. V. Comparison of hydrochlorothiazide with a new quinethazone diuretic, metolazone. Clin Pharmacol Ther 12:843, 1971.
2. Materson BJ, Oster JR and Perez-Stable EC: Antihypertensive effects of metolazone (Zaroxolyn). Curr Ther Res 16:890, 1974
3. Fotiu S, Mroczek WJ, Davidov M and Finnerty FA, Jr: Antihypertensive efficacy of metolazone. Clin Pharmacol Ther 16:318, 1974
4. Sambhi MP, Eggena P, Barrett JD, et al: A crossover comparison of the effects of metolazone and hydrochlorothiazide therapy on blood pressure and renin angiotensin system in patients with essential hypertension. in *The Systemic Effects of Antihypertensive Agents*, Sambhi MP (Ed.); Miami, Fla., Symposia Specialists, 1976.
5. Cangiano JL, Campos JA, Trevino A, Ramirez-Gonzalez R and Ramirez-Muxo O: The effects of metolazone in the long-term treatment of essential hypertension. Curr Ther Res 16:778, 1974
6. Materson BJ, Hotchkiss JL, Barkin JS, Rietberg BH, Bailey K and Perez-Stable EC: Oral metolazone: effects on urine composition in water-loaded man. Curr Ther Res 14:545, 1972.
7. Michelis MF, DeRubertis F, Beck NP, McDonald RH and Davis BB. Standard oral water load to determine the site of action of diuretics in man: with data on metolazone, a new diuretic. Clin Pharmacol Ther 11:821, 1970.
8. Belair EJ, Kaiser F, VanDenburg B, Borrelli A, Lawlor R, Panasevich R and Yelnosky J: Pharmacology of SR 720-22. Arch Int Pharmacodyn 177:71, 1969.
9. Puschett JB and Rastegar A: Comparative study of the effects of metolazone and other diuretics on potassium excretion. Clin Pharmacol Ther 15:397, 1974.
10 Editorial: When to measure renin. The Lancet, pp 783-784, April 5, 1975

Computerized Tomography of Intracranial Tumors

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Computerized tomography (CT) is a new and invaluable tool for the evaluation of cerebral neoplasms. A methodology for the CT evaluation of intracranial tumors is presented, emphasizing the use of contrast enhancement for the initial scan. The role of CT-scanning relative to other neuroradiologic modalities is discussed. Examples of the capability of CT-scanning in the diagnosis of intracranial neoplasms are presented.

COMPUTERIZED TOMOGRAPHIC (CT) scanning of the brain is a new radiological modality that allows for a rapid and painless evaluation of cross-sectional anatomy. It is a highly specific method for the localization and characterization of central nervous system pathology. CT-scanning, utilizing the ACTA scanner, has been of great help in the evaluation of cerebral neoplasms at the University of Minnesota Hospitals. A brief review of the underlying principles of the scanner, examples of its diagnostic capabilities for intracranial tumors, and a discussion of the methodology for central nervous system tumor evaluation will be presented.

Physical Principles of CT-Scanning

The physical parameters and mathematical considerations of CT scanning have been discussed in great detail in other publications.[1,2] Briefly, computerized tomography relies on the differential attenuation of an x-ray beam by different tissue structures. The beam is collimated to pass through a thin transverse section of the patient's head. Because two detectors are used, each scan produces two images of cross-sectional anatomy; the images are separated by three millimeters and each is roughly one centimeter thick. To examine the entire brain, five scans are generally required, producing ten cross-sectional images. A single cross-sectional image consists of a matrix array of relative x-ray absorption values displayed on a TV monitor. Each point of the matrix represents a volume of approximately 1.5 × 1.5 × 10 millimeters of the patient's brain. The degree of attenuation of each point is displayed on the TV monitor as varying shades of gray and photographed.

Our present CT scanner requires four and one-half minutes per scan (two images). Scanning at four different levels to cover the majority of the brain requires eighteen to twenty minutes. Any motion during the scan will produce streaking artifacts. Thus, sedation of the patient may be necessary to insure cooperation. The radiation dose to the head for a complete four-level scan varies between 1.7 rads to that side of the head closer to the x-ray tube to about 0.4 rads to the opposite side.

Contrast Enhancement

Differences in attenuation of the x-ray beam on the order of or slightly less than one percent may be discerned with this system. Generally, there is no difficulty in distinguishing the density of normal cerebral parenchyma from that of cerebrospinal fluid or from an intracranial hematoma, since the differences in density are relatively great. However, some tumors have densities approaching or equal to that of normal brain tissue. In order to enhance the density differences between normal brain and tumor, iodinated contrast material is injected intravenously. Most tumors will show a definite, and oftentimes marked, increase in beam attenuation (increased "density") due to passage of contrast media into the tumor. Some of this tumor enhancement is due to collection of

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contrast within the vascular pool. However, the majority of the enhancement is due to passage of the contrast material across an abnormal "blood-brain barrier" and accumulation of the contrast within the interstices of the tumor.[3] The breakdown of the normal blood-brain barrier is a non-specific phenomenon, occurring with neoplasms, infarction, and inflammatory lesions; varying degrees of enhancement can occur with any of these lesions. The passage of the contrast across the blood-brain barrier is similar to the passage of radioisotopes in brain scanning, but a much greater degree of resolution is afforded by computerized scanning.

Scanning Protocol

At the University of Minnesota Hospitals, any patient that is a brain tumor suspect receives iodinated contrast material for the initial scan. If the scan is normal, no further scanning is performed. If an abnormality is found, the tumorous nature is usually apparent from the mass effect, margins, or multiplicity, in correlation with the clinical history. The question of an occult neoplasm, demonstrable only with contrast enhancement, is quickly settled. The multiplicity of metastases is immediately evident. Generally, little additional information will be gained from a non-enhanced scan that is not more discernible from an enhanced one in the usual pre-operative tumor patient.

Other clinical conditions dictate a different approach. Scanning in cases of trauma, recent cranial surgery, intracerebral hemorrhage, and hydrocephalus is performed without contrast enhancement. Diagnostic confusion may arise in the first three categories if contrast material is used in the presence of an acute hemorrhage. Contrast media can be used subsequently, if indicated. Cases of arteriovenous malformation or aneurysm, cerebrovascular accident, and inflammatory conditions are performed both with and without contrast enhancement. With aneurysms or arteriovenous malformations, the hemorrhage can be discerned on the non-enhanced scan while the offending agent can be detected on the enhanced one. Subtle findings of cerebrovascular accidents and inflammatory conditions can occasionally be masked by contrast material. In other instances the abnormality

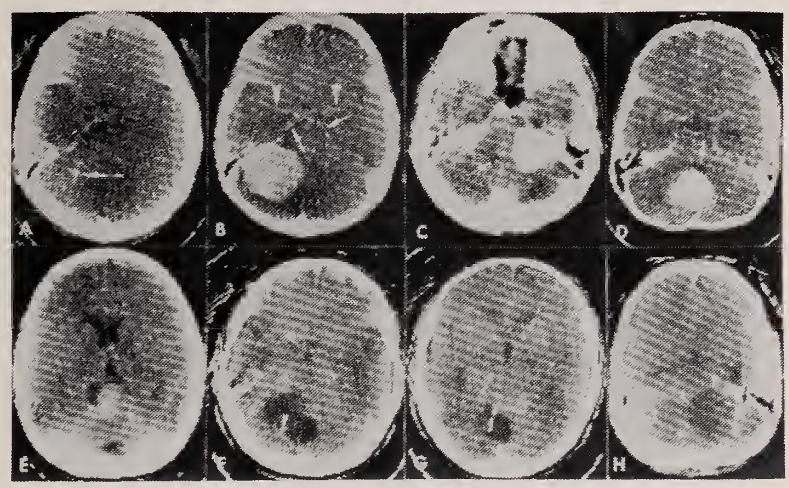

Fig. 1 — Posterior Fossa Masses

A and B. Focal calcification near the left cerebellopontine angle is seen on non-enhanced scan (A). Well circumscribed margins and homogeneously dense matrix of this large meningioma are seen after contrast administration (B). Note the visualization of the middle (arrowheads) and posterior (arrows) cerebral arteries.

C. Right acoustic neurinoma produces compression and displacement of the IVth ventricle (arrow). Enhanced scan.

D. Enhanced scan of a medulloblastoma of the cerebellar vermis, compressing the IVth ventricle (arrow) and displacing it anteriorly.

E. Enhanced CT scan demonstrates a superior vermian medulloblastoma in this 12-year-old child. All other radiologic tests were normal.

F and G. Two separate nodules (white arrowheads) are visualized in this cystic hemangioblastoma of the cerebellum following contrast enhancement.

H. The solid portion (black arrow) of this metastasis to the right cerebellar hemisphere from carcinoma of the breast is demonstrated with contrast enhancement. Medial to this is a large cystic component (white arrowheads).

may be evident only after the administration of contrast medium. When there is a clinical problem with differential diagnosis, such as that between infarction and neoplasm, non-enhanced scanning is performed first, followed by scanning with contrast enhancement. Thus, the examination is "tailored" to fit the patient's condition and the most likely diagnostic possibilities.

In a small percentage of cases, it is necessary or desirable to perform an unenhanced CT-scan 24 hours after the enhanced scan. With proper selection, the number of these patients is very small. In addition, all scans are reviewed by a neuroradiologist before the patient leaves the Department. This further reduces the number of repeat examinations.

It should be noted that the approach to the use of contrast material discussed above, particularly the use of contrast for the initial scan in tumor suspects, is not universally accepted. Many institutions prefer to obtain a non-enhanced scan first on all patients. Scanning with contrast enhancement is subsequently performed if tumor is suggested.

The intravenous dose of contrast material for adults at the University of Minnesota Hospitals is 50 cc's of Hypaque-60* as a bolus, followed by 300 cc's of Reno-M-Dip** administered over four to five minutes. A total of 56 grams of iodine is administered. Children receive a lesser amount proportional to their weight. The amount of contrast material used in adults varies among different institutions ranging, from 14 to 56 grams of iodine.

Case Material

CT scanning is an excellent method for demonstrating the mass effect of intracranial tumors. Displacement of the calcified pineal or choroid plexus (Figures 2C and 3H), ventricular shift and compression (Figures 1C, 1D, and 2A), ventricular obstruction

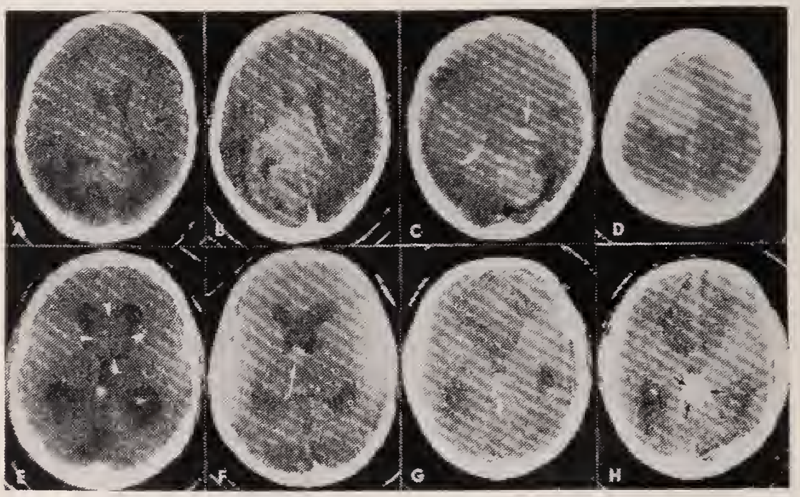

Fig. 2 — Supratentorial Masses

A and B. Non-enhanced scan (A) demonstrates obliteration of a portion of the left lateral ventricle by a left parieto-occipital mass. Contrast enhancement (B) offers much better visualization of the margins of this large glioma. (Note visualization of choroid plexus of right lateral ventricle in B, a normal finding on enhanced scans.)

C. Enhanced scan of a right occipital glioma. The high density tumor is surrounded by low density cerebral edema. Calcified choroid plexus of right lateral ventricle (arrow) is displaced anteriorly.

D. Large, well circumscribed, homogeneously dense lesion after contrast enhancement, located in high convexity-parasaggital region. All characteristics are typical for meningioma.

E. Intraventricular lesion (arrowheads) producing moderate obstructive hydrocephalus. This was a glioma of the septum pellucidum.

F. Moderately high density lesion (arrow) without contrast enhancement, located at foramen of Munro. Typical of colloid cyst of the III ventricle.

G and H. Multiple calcifications in pineal region (white arrow) on non-enhanced scan in a nine-year-old male. Moderately severe obstructive hydrocephalus. Following administration of contrast material, the size of this pinealoma (black arrows) is demonstrated.

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* Hypaque Meglumine 60%, brand of meglumine diatrizoate, USP, Winthrop Laboratories, 90 Park Avenue, New York, New York, 10016.

** Reno-M-Dip, 30% Meglumine Diatrizoate injection for drip infusion, E. R. Squibb and Sons, P. O. Box 4000, Princeton, New Jersey, 08540.

(Figures 2E through H), and compression of sulci and subarachnoid cisterns (Figures 3G, 4A through D) are easily demonstrated. Abnormal calcifications (Figures 1A, 2G and 4C) may not be detectable on plain skull roentgenograms, but are easily identified by CT scanning because of their very high density.

Contrast enhancement is utilized for definition of the size and extent of the tumor and evaluation of its margins. While the non-specific findings of calcification or ventricular shift and compression may signal the presence of a mass, the tumor's true size and its margins may not be well visualized unless contrast material is used (Figures 1A and 1B, 2A and B, 2G and H). Very slow growing and/or peripheral lesions such as meningiomas (Figure 2D) may not produce any significant mass effect and may not be visualized unless contrast material is used. We have found unsuspected meningiomas with contrast enhancement on a number of occasions. The multiplicity of metastases is seen with contrast administration (Figures 3A through F). While a non-enhanced scan may suggest a purely cystic lesion, contrast enhancement may allow visualization of a solid component (Figures 1F through H). The visualization of an aneurysm, and occasionally its point of origin (Figures 4C and D), requires contrast material.

The characteristics of a lesion as defined by computerized tomography may give good indications as to its etiology. In our experience, numerical absorption coefficients (μ) are too non-specific to be reliable as histologic indicators in any given case. However, a number of visualized parameters are helpful. Meningiomas, acoustic neurinomas, and pituitary adenomas frequently have densities equal to surrounding brain, but commonly increase in density dramatically with contrast enhancement (Figures 1A through C, 2D, 4A and B). They generally have well-circumscribed margins and are homogeneous in their density. Gliomas may have slightly increased or decreased density relative to normal brain on the non-enhanced scan, and generally enhance to a moderate, and oftentimes marked, degree (Figures 1D and E, 2A through C). However, their margins are frequently irregular. In addition, the increased density is frequently peripheral, producing the so-called "ring sign", which can also be seen with metastases, abscesses, infarcts, and hematomas. Metastases are usually multiple, are frequently spherical, and commonly produce a greater amount of surrounding cerebral edema than a primary neoplasm of the same

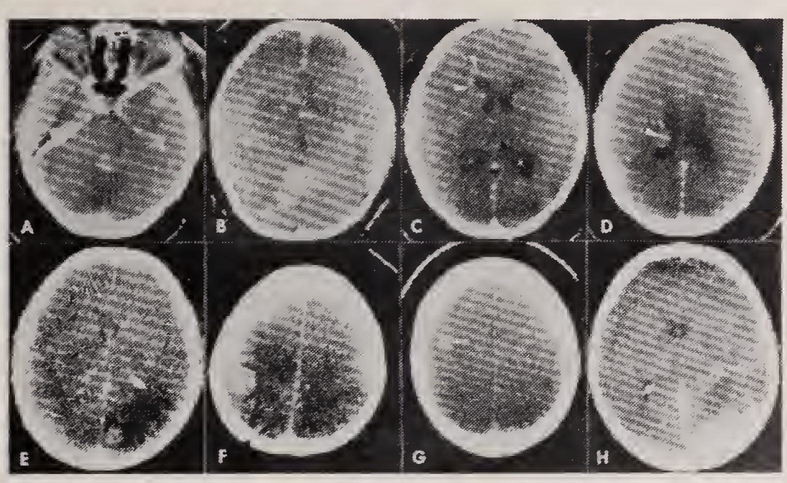

Fig. 3 — Metastases.

A and B. Multiple metastases of melanoma, well demonstrated on enhanced scan. The isotope scan in this patient showed only two lesions.

C and D. Subependymal metastases (arrowheads) are occasionally seen with primary or secondary intracranial tumors. Same case of metastatic melanoma as in A and B.

E and F. Metastases commonly produce large areas of cerebral edema. Patient has metastatic carcinoma of the lung to the right occipital (E) and left parietal (F) lobes.

G. Some metastases produce little edema, as in this case of solitary metastasis (arrowhead) from carcinoma of the lung. Note compression of cortical sulci. Isotope brain scan and angiography were normal.

H. Displacement of the calcified choroid plexus of the right atrium (arrow) is produced by a large chloroma of the right occipital lobe, demonstrated with contrast enhancement. Patient has chronic lymphatic leukemia.

size (Figures 3A through G). Some lesions have characteristic locations, such as the colloid cyst of the III ventricle (Figure 2F), which commonly is slightly denser than surrounding brain on the non-enhanced scan. Pinealomas have a characteristic location, are commonly calcified, and usually enhance to a marked degree, allowing visualization of the true size and extent of the lesion (Figures 2G and H). Slow growing lesions may produce bony deformity, indicative of their long-standing nature.

A lesion cannot be considered truly cystic simply because it has low absorption coefficients. We have seen a number of grossly solid gliomas with absorption coefficients in the range of that of the cerebrospinal fluid, even after contrast enhancement. Sharp margins of a lucent lesion are required before the diagnosis of a cyst is made. Contrast enhancement is essential to define other components of the lesion (Figures 1F through H).

Discussion

There is no question that computerized tomographic scanning is of immense value in the diagnosis of brain tumors. As a screening procedure for cerebral neoplasm it is rapid and painless, and has an overall accuracy that equals or exceeds other neuro-radiologic modalities.[4] Except for certain tumors, including small intrasellar and suprasellar lesions and subtle expansions involving the brain-stem, the overwhelming majority of intracranial neoplasms have been accurately identified with CT-scanning. We have seen a number of cases of tumor demonstrable only by CT-scanning, and not by angiography and/or isotope brain scanning. The extent of a neoplasm is frequently far better revealed by CT-scanning than by other

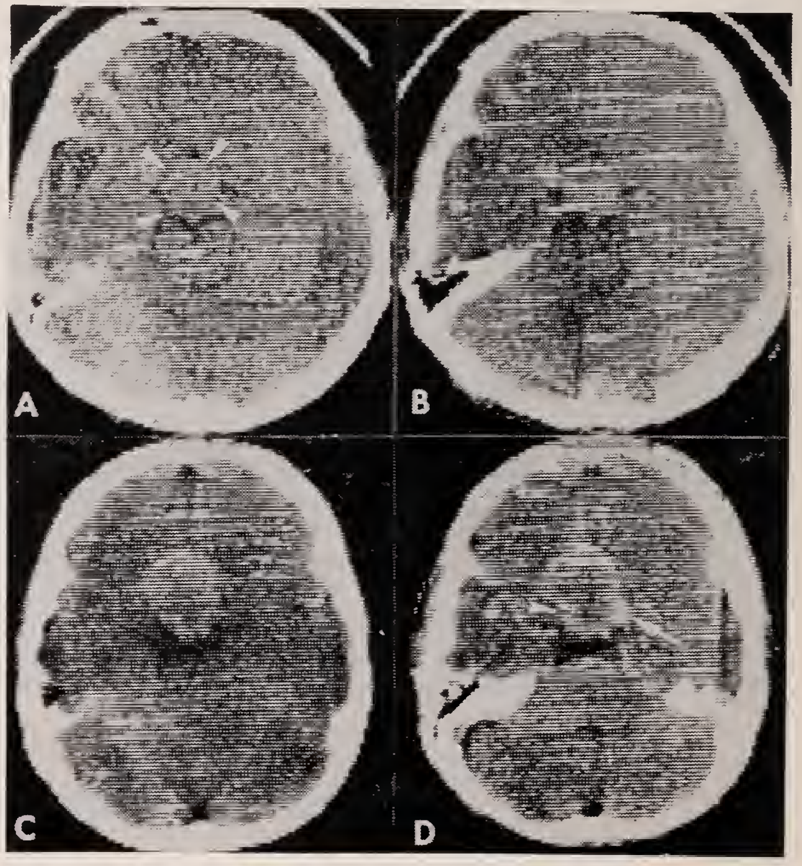

Fig. 4 — Suprasellar Masses

A and B. A well circumscribed mass (arrowheads) in the suprasellar region is seen before contrast enhancement (A). There is some enhancement after contrast administered (B). Pituitary adenoma.

C and D. A large calcified suprasellar and pre-sellar mass is seen on the non-enhanced scan (C). Following contrast administration (D), a portion (arrowhead) of this huge left carotid artery aneurysm opacifies and is enveloped by the mass, which contains laminated clot, proving the aneurysm arises from the left. A right carotid artery aneurysm (arrow) is also present.

radiologic or isotope examinations. The multiplicity of metastases has been demonstrated frequently by CT-scanning when angiography or isotope brain scanning has revealed only a solitary lesion.

The enhancement of primary and secondary tumors with iodinated contrast material during computerized scanning has been of such benefit that the evaluation of any suspected intracranial neoplasm, either primary or secondary, should be considered incomplete unless intravenous contrast material has been used. We have seen numerous examples of a tumor producing non-specific mass effect or no mass effect on the non-enhanced scan, only to find it clearly delineated after contrast injection. Slowly growing or peripherally located tumors not causing ventricular displacement may not be visualized unless contrast material is used. This is particularly true of meningiomas. The multiplicity of metastatic nodules may not be apparent without the use of contrast medium.

The current radiographic evaluation of a patient with a suspected intracranial neoplasm at the University of Minnesota Hospitals begins with a CT scan, utilizing contrast enhancement for the initial scan as previously discussed. With a few exceptions, no further neuroradiologic examinations are performed if the scan is normal. Patients with suspected brainstem tumors or with possible intrasellar-suprasellar masses undergo pneumoencephalography for definitive evaluation in spite of a normal scan. Rarely, a patient who is strongly suspected of having a neoplasm, but who has a normal CT scan, may have angiography or pneumoencephalography in order to totally exclude the possibility of an occult lesion.

If the scan indicates a primary tumor or solitary metastasis, angiography usually is performed. Angiography is utilized to evaluate the blood supply to a tumor, relate the lesion to familiar angiographic landmarks, and assess the histologic possibilities pre-operatively. Pneumoencephalography is reserved for brainstem, midline and suprasellar-intrasellar expansions.

The number of cerebral angiograms performed at the University of Minnesota Hospitals has not changed since the installment of the computerized scanner. CT-scanning has not only detected those intracranial neoplasms that were suspected clinically, but has also uncovered neoplasms that presented in an unusual fashion. The angiographic evaluation of all these cases, added to that of increasing numbers of cases of vascular disease, has kept the annual number of angiographic procedures stable.

On the other hand, the number of pneumoencephalograms performed per year has dropped dramatically, as it has in other institutions.[5] CT-scanning is a sensitive method for the evaluation of hydrocephalus and atrophy. The majority of the pneumoencephalograms now performed are for neoplasms involving the areas noted above.

While the number of isotope brain scans performed per year had decreased in other institutions,[5] it has remained relatively stable at our university, because our single CT scanner has not been able to handle the large case load. One suspects that the number of isotope brain scans would drop if CT-scanning facilities were limitless. However, we do not believe that isotope brain scans will ever be totally replaced. Occasionally, it supplies important information that cannot be derived from the computerized scan. For example, the CT scan may show a spherical lesion of low density even after contrast enhancement, making the distinction between benign cyst and cystic neoplasm impossible. The diagnosis of neoplasm can then be made if the isotope scan discloses abnormal accumulation of radioactivity within the same lesion.

It should be stressed that the appearance of a lesion on the CT-scan may be non-specific. For example, the CT-scan appearance of infarction may occasionally resemble a tumor. Contrast enhancement of infarcts, particularly at the margins, has been seen by ourselves and others.[6] The position of the lesion in a vascular distribution, extending to the cortical surface, and the relative lack of mass effect are findings in favor of infarction. Sometimes a follow-up scan in three to four weeks may be necessary to settle the question. The CT-scan findings will generally be stable in the case of a tumor, while change will likely occur as an infarct evolves. Thus, other neuroradiologic modalities, sequential CT studies, and clinical correlation are important in difficult cases.

Acknowledgment

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References

1. Hounsfield GN: Computerized Transverse Axial Scanning (Tomography). Part 1. Description of the System. Brit J. Radiol 46:1016, 1973.
2. Ambrose J: Computerized X-ray Scanning of the Brain. J Neurosurg 40:659, 1974.
3. Gado MH, Phelps ME, and Coleman RE: An Extravascular Component of Contrast Enhancement in Cranial Computed Tomography. Part II: Contrast Enhancement and the Blood-Tissue Barrier. Radiology 117:595, 1975.
4. Baker HL: Computer Assisted Tomography of the Head. An Early Evaluation. Mayo Clin Proc 49:17, 1974.
5. Baker HL, Cambell JK, Houser OW, et al: The Impact of Computed Tomography on Neuroradiologic Practice. Radiology 116:637, 1975.
6. Yock DH, Marshall WH: Recent Ischemic Brain Infarcts at Computerized Tomography: Appearances Pre- and Post-Contrast Infusion. Radiology 117:599, 1975.

Minnesota's C(harles) Donald Creevy

(1902-1977) and UROLOGY

OWEN H. WANGENSTEEN, M.D.*

AFTER A LONG, PRODUCTIVE, and creative career in Minnesota urology, Donald Creevy died suddenly and peacefully of emphysema early Monday morning, 31 January, a toll and price exacted from ardent cigarette smokers. Some alternative extrapulmonary route must be found to satisfy the hunger and thirst for nicotine, probably the strongest of all drug addictions.

Creevy left a host of admiring colleagues, friends, and former patients, a loving wife, Alice, two sons, one of whom is an obstetrician and gynecologist in San Francisco, and a sister, all of whom will cherish Don's memory with pride and affection. Medicine and Urology will be the richer for his having lived and worked amongst us.

Donald Creevy, Professor emeritus of urology at the University, was a product of Minnesota. Born in Minneapolis, he attended its public schools successively, Garfield elementary school, and Central High School, later the University of Minnesota where he earned the Bachelor of Science degree in 1924, and a Bachelor's degree in medicine upon completion of the medical curriculum studies in 1926. He served the required year's internship at the Lane Hospital at the University of California in San Francisco upon completion of which, in 1927, he was awarded the M.D. degree by the University of Minnesota. During his medical training, Dr. Creevy had been attracted to surgery and had decided upon an academic career in urology. Dr. Louis B. Wilson, Director of the Mayo Graduate School in Rochester kindly arranged for Dr. Creevy to secure special training in urology under the direction of Dr. William F. Braasch in the Mayo Clinic and Foundation. There Dr. Creevy worked under the immediate supervision of Hermon Bumpus, superb

Dr. C. Donald Creevy (reproduced from the July 1971 issue of *Minnesota Medicine)* in which Dr. Elwin E. Fraley, Creevy's successor, and other community urologists dedicated papers in a tribute of acknowledgment to Dr. Creevy and his accomplishments.

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*Regents' Professor University of Minnesota, Minneapolis, Minnesota.

endoscopist, and with other members of Dr. Braasch's staff, acquiring experience and expertise in cystoscopy and urological diagnosis. After 15 months at Rochester, Creevy returned to Minnesota for an additional year's work in operative surgery as the senior surgical resident, also meeting the thesis requirement for satisfaction of the Ph.D. in the Graduate School. In the summer of 1931, Creevy departed for Berlin where he spent 6 months with Professor A. v. Lichtenberg, eminent urological surgeon at the St. Hedvig's Krankenhaus, following which Creevy did a tour of well known Viennese, German, and Swiss urological clinics, returning to the University of Minnesota in the fall of 1932.

Creevy had chosen for his Ph.D. thesis, Studies upon Sudden Decompression of the Chronically Distended Urinary Bladder. He based his studies on 71 patients admitted for treatment of prostatic obstruction at the University Hospital or the Mayo Clinic, all of whom died while under observation for treatment of prostatic obstruction. He scrutinized carefully and thoroughly the postmortem findings, learning that purulent cystitis and suppurative pyelonephritis were constant occurrences. Creevy's paper became a landmark, establishing definitely that the principal lethal factor in the demise of patients with prostatic obstruction of the urinary tract was infection, a conclusion that availability of the sulfonamides and antibiotics reaffirmed.

A prevalent thesis prior thereto had been that a state of shock followed sudden and complete emptying of the chronically distended bladder. Henry Thompson (1868), London's foremost urologist in the last quarter of the nineteenth century had only the catheter to suggest for prostatics to relieve urinary retention. He recounted the circumstance of a patient standing, braced up against a wall from whose urinary bladder 6 pints of urine were evacuated by catheter, following which the patient collapsed and died. From shock, said Thompson, owing to sudden complete emptying of the bladder; had he added shock owing to postural hypotension, his conclusion would have been a bull's eye. van Zwalenburg of Riverside, California (1920) had advocated and practiced gradual decompression of such bladders connecting an indwelling urethral catheter to a urinary container higher than the patient's bed, which receptacle was gradually lowered over a period of several days until complete emptying of the urinary bladder could be achieved without deterioration of the patient's status. Prontosil and sulphanilamide (1935-36) and penicillin (1942-44) indicated that gradual urinary decompression was no longer necessary confirming the validity of Creevy's 1931 thesis, subsequently published in the *Archives of Surgery*[*]. The two-stage prostatectomy also disappeared with the advent of sulfonamides and antibiotics.

In reporting upon his urological study-trip to German speaking Europe, Creevy[†] reported that such studies are "rather for the man who has had his fundamental training than for him who seeks it . . . in brief such a journey increases one's appreciation and enjoyment of his work and particularly of his country."

Creevy's publications are approximately 150 in number, including a small manual for medical students and urological house-officers. Many of his writings reveal a keen interest in the history of urology. Early in his urological career, Creevy displayed a capacity to accommodate readily use of indirect as well as the more simple direct-vision endoscopy, a facility that stood him in great stead in development of unusual skill in perfecting his technique of transurethral prostatic resection, in which procedure he had few if any equals. He was also among the first to recognize that distilled water was not a safe medium in which to conduct the repetitive maneuvers required for section and removal of obstructing prostatic tissue, because entry of the hypotonic solution into the freshly sectioned tissue invited hemolysis of the patient's blood. By substituting an isotonic solution, even though it dimmed slightly the vision of the operator, hemolysis was avoided thereby. Creevy and his working collaborators[‡] were able to report 500 consecutive transurethral resections with a mortality of 0.6 percent, a striking contrast to the over-all achievement when Creevy became assistant director of the Division of Urology following his European study trip.

It is one of the mysteries of surgery that whereas perineal lithotomy for vesical calculus had been a successful endeavor in the hands of several mid-eighteenth century urological surgeons, removal of prostatic tissue for hypertrophy and obstruction did not come about until McGill of Leeds and Belfield of Chicago independently (1887) first suggested and developed suprapubic prostatectomy for prostatic obstruction; prior thereto, the answer in the best of hands including Samuel D. Gross of Philadelphia (1855), James Paget of London (1866), and Sir Henry

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[*] 25: 356-385, August 1932.

[†] Minnesota Med 16:428-34, June, 1933

[‡‡] Personal Communication, January 1975

Thompson of London (1868) had been the urinary catheter; usually the victim of prostatic obstruction was advised to carry the catheter beneath his hat band or in a concavity of his walking cane.

Guthrie of Britain (1834) and Mercier of Paris (1839) and others had devised techniques of slitting prostatic tissue with transurethral cutting instruments, but its employment had been confined to a few with special talent for visualizing and sectioning obstructing prostatic tissue. Prior to transurethral prostatic resection emphasis had been upon the amount of prostatic tissue removed and the size of the resultant tunnel — but no longer; emphasis today is solely upon removing enough obstructing tissue to create a functional channel for the outflow of urine. The Stern (1926) McCarthy-Creevy succession in achieving such functional channels has been of the greatest importance in setting aside the need for removal of both lateral and mid prostatic lobes, and is throughout our country today the most frequently performed operation to relieve benign prostatic obstruction.

In his Presidential Address to the American Urological Association, Hugh Cabot (1911), then of Boston asked, "Is urology entitled to be regarded as a specialty?" He answered in the affirmative, but lamented that in New England, urology was only a diagnostic outpatient service with no allotment of hospital beds. Young's development of endovesical punch prostatectomy (1913) and Stern's (1926) creation of an electrically activated instrument for removing prostatic obstructions brought operative urology out of the hands of the general surgeon, establishing urology as a firm and independent discipline, its keenest exponents excelling in diagnostic as well as operative urology. Creevy emerged as a talented leader in both of these segments of the discipline. Creevy acquired unusual skills as an operating surgeon contributing significantly to development of plastic techniques to relieve anatomic obstructions at the uretero-pelvic juncture. His skill in repairing and straightening the penis for hypospadias had many imitators.

Since urology became an independent surgical discipline, urology is no longer solely a diagnostic discipline at the Mayo Clinic; well trained urological surgeons do all the operative procedures that fall within that province. Minnesota has been fortunate in having several sons who acquired national and international prominence in their specialty, notably Braasch at Mayo's, Creevy the first full-time representative of urology at the University, and Frederic Foley of St. Paul, Clinical Professor also at the University, renowned for his skill in devising original instruments. The Foley urethral catheter with an attached balloon enjoys world-wide usage as the simplest device to retain the catheter within the bladder. It also has been adapted by Fogarty for use in vascular surgery.

Creevy was regular in attendance and a frequent active participant in the scientific sessions at meetings of the most prestigious urological societies. The Minnesota Urological Association was undoubtedly his favorite meeting, where his presence was highly valued, and where he always felt comfortable and at ease, among a host of homefront friends.

Following retirement from the Chairmanship of the Division of Urology at the University (1968), Creevy entered the private practice of urology in Minneapolis. He had always been fascinated by dialogues with patients with whom he readily formed a reciprocal relationship of admiration and affection; to his patients he was always readily accessible, who adored him in consequence.

Creevy was greatly admired by many successive classes of undergraduate medical students. His absorption and fascination with the romance and imagery of words was definitely out-of-the ordinary. He had an unusual facility for making his well prepared lectures interesting and informative. In carefully chosen words, one could follow his well punctuated articulate phrases as if spelled out in beautiful sentences. To a smaller group of graduate students in urology, Creevy was also a hero, amongst whom he developed a school of loyal and devoted followers. At the invitation of Dean Harold Diehl, Creevy spent 9 years as Assistant Dean, portraying from the Dean's Office as fine a student-teacher relationship as ever existed in the University's School of Medicine (July 1936-October 1945), an attitude that deserves cultivation in these troublous times. As understanding, effective and innovative teacher of urology, sympathetic and devoted physician, loyal colleague, and warm friend, Donald Creevy will be kindly remembered in the many circles in which he moved. He had an abiding interest in the History of Urology and his many colleagues and friends will be pleased to learn that this consuming interest of Donald Creevy will be perpetuated in the History of Medicine Section of the Biomedical Library where a C. Donald Creevy Endowment Fund has been established as a worthy Memorial to commemorate the activities of a great urologist, effective teacher, and warm friend.

Health Care Cost Commission

Editor's Note: The Minnesota State Medical Association has formed a Health Care Cost Commission to study and deal with the escalating medical costs: The following is the opening address given by Dr. Richard J. Frey, Chairman of this Commission, to members of that Commission at its first meeting on May 27. Following Dr. Frey's address you will find a list of the members of the Commission. Each month we will bring you additional information on this Commission.

The Minnesota State Medical Association represents some 5,000 physicians in this state, and as a group I can say we are deeply concerned about the continuing spiral of health care costs not only in Minnesota but throughout the nation.

We could approach this situation in a variety of ways. We could, for example, say that the problem doesn't exist. Then again, we could as physicians blame it on hospitals, or government, or health planners, the insurance industry, the public, or someone other than ourselves. These elements undoubtedly play a very significant role in this problem. Then again, we might say that physicians as a group contribute significantly to high costs. Although physicians' fees are a relatively small part of the health care dollar, physicians as a group serve as purchasers of medical and health care for their patients and are indeed a major factor in determining the extent of total health care expenditures in this nation. About 70% of health care expenditures are under the direction of the physician.

Quite obviously the Minnesota State Medical Association has adopted a course of accepting the fact that the medical profession is key to any system of health care and its costs. In doing so, we must conclude that physicians can and must play a major role in reducing or at least stabilizing health care costs. The Minnesota State Medical Association through the establishment of its Health Care Cost Commission is very serious in its attempt to do whatever possible to contain health care costs in Minnesota. Physicians should be the most qualified to establish priorities in health care within the limits of our natural resources. We must accept the reality that today we have a capacity of spending an unlimited amount of dollars in health care. Expanded technology alone has magnified this capacity, and the end is not in sight. We must accept the reality that our resources are limited. We will soon approach 10% of the gross national product for health care costs. Not only must we examine our priorities, but it is timely that we evaluate the cost benefits of these expenditures in terms of outcome. Physicians must always be guardians of quality care but even more cost sensitive if true quality care is to be preserved as we soon define the limits of our health resources. This is a challenge of monumental dimensions. Physicians need help, and this is why we are extremely pleased to have attracted such a high caliber of individuals who are willing to serve on this Health Care Cost Commission. Together we seek to solve this serious problem.

In establishing this Health Care Cost Commission, the Board of Trustees of the Minnesota State Medical Association has given this Commission every assurance that it will be an independent body, that its recommendations will stand for public review and comment, and that they will not be altered in any way by the Association. We are fully prepared—and I have reminded my colleagues of this—that we as a group of physicians and as an Association may well receive some recommendations from this Commission that we will find difficult to accept. I hope and believe that we are big enough and objective enough to act on the recommendations that I know this Commission will develop over the course of the next 18 months.

I can assure all that the Minnesota State Medical Association did not establish this Commission as a public relations effort. If that had been our objective, I can further assure you that we would not have selected the kind of individuals that are participating in this Commission representing, as I am sure you will agree, a diversity of opinion and philosophy as it relates to health care. Neither are we naive enough to the point of believing that this Commission can resolve once and for all the overwhelming problem of health care costs in all of its many facets. However, we can clearly identify the problem and make specific recommendations to address that problem here in Minnesota.

The objective of this Health Care Cost Commission is to clearly define the health care cost system in Minnesota along with the costs inherent in that system and to specifically recommend in our final report ways to solve these problems. This will not be a forum to protect or promote the parochial interests of any element in the health care field. Our purposes will not be served if our examinations fail to address the multiple facets that contribute to the health dollar consumption. No simplistic solution will be found.

As we look down the road during the next 18 months, I cannot honestly say how this effort will be concluded. This is up to the Commission members. I happen to believe that we have an assembly of broad expertise and concern, the best experts in this state to address this problem, and the Minnesota State Medical Association is deeply appreciative of their willingness to serve with us in this important endeavor.

Richard J. Frey, M.D.
Chairman

Members of the Commission

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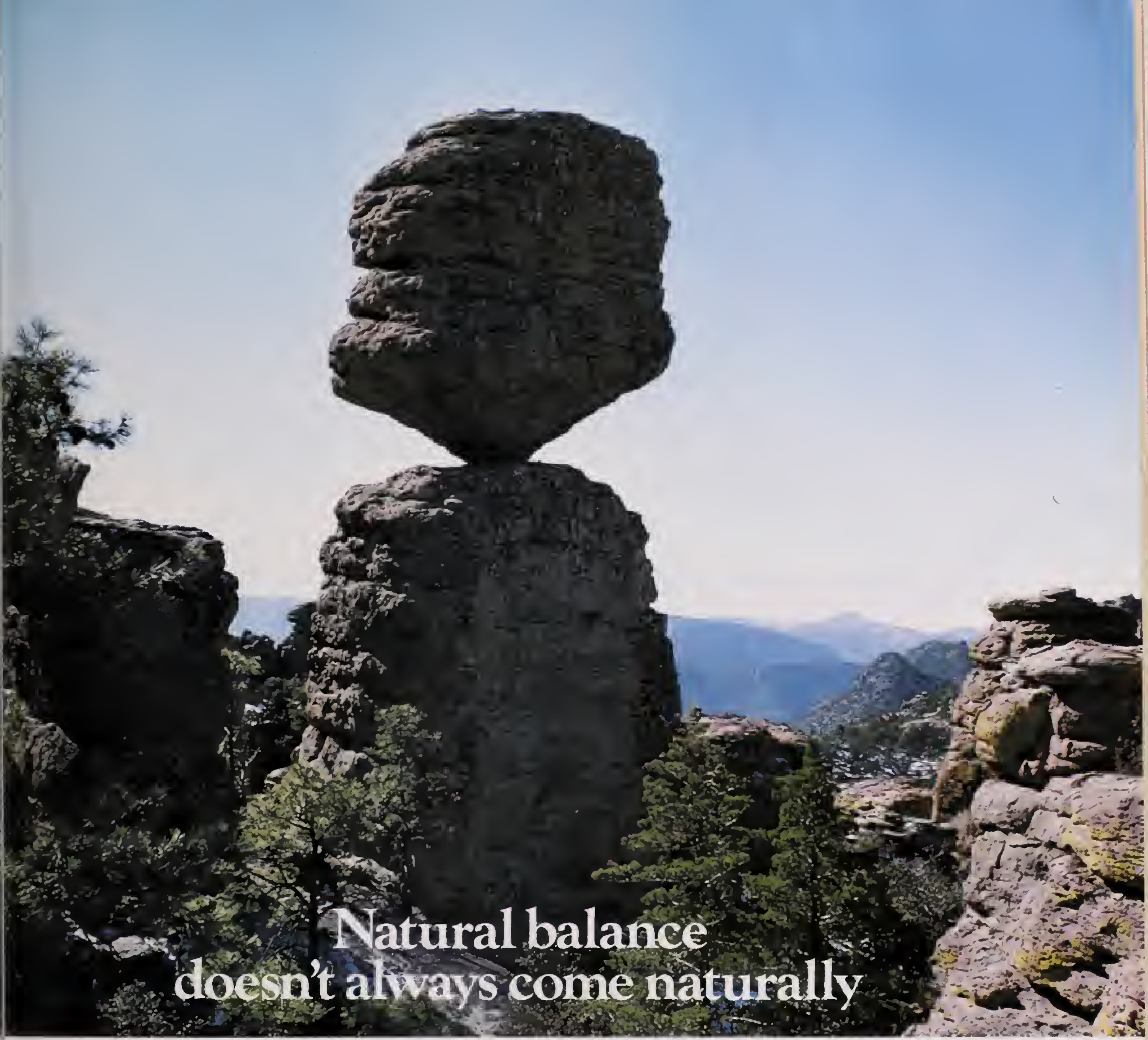

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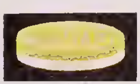

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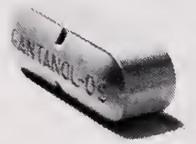

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ons. Measure sulfonamide blood levels as variations
ccur: 20 mg/100 ml should be maximum total level.
aindications: Sulfonamide hypersensitivity; preg-
at term and during nursing period; infants less than
nths of age.
ngs: Safety during pregnancy has not been estab-
Sulfonamides should not be used for group A
emolytic streptococcal infections and will not eradi-
prevent sequelae (rheumatic fever, glomerulone-
of such infections. Deaths from hypersensitivity reac-
agranulocytosis, aplastic anemia and other blood
sias have been reported and early clinical signs
hroat, fever, pallor, purpura or jaundice) may indi-
erious blood disorders. Frequent CBC and urinalysis
icroscopic examination are recommended during
amide therapy. Insufficient data on children under
chronic renal disease.
tions: Use cautiously in patients with impaired renal
atic function, severe allergy, bronchial asthma; in glu-
-phosphate dehydrogenase-deficient individuals in
dose-related hemolysis may occur. Maintain ade-
luid intake to prevent crystalluria and stone formation.
se Reactions: *Blood dyscrasias* (agranulocytosis,
c anemia, thrombocytopenia, leukopenia, hemolytic
, purpura, hypoprothrombinemia and methemo-
emia); *allergic reactions* (erythema multiforme, skin
ns, epidermal necrolysis, urticaria, serum sickness,
pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis); *gastrointestinal reactions* (nausea, emesis, abdominal pains, hepatitis, diarrhea, anorexia, pancreatitis and stomatitis); *CNS reactions* (headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo and insomnia); *miscellaneous reactions* (drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L.E. phenomenon). Due to certain chemical similarities with some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia as well as thyroid malignancies in rats following long-term administration. Cross-sensitivity with these agents may exist.

Dosage: Systemic sulfonamides are contraindicated in infants under 2 months of age (except adjunctively with pyrimethamine in congenital toxoplasmosis). *Usual adult dosage:* 2 Gm (2 DS tabs or 4 tabs or 4 teasp.) initially, then 1 Gm *b.i.d.* or *t.i.d.* depending on severity of infection.

Usual child's dosage: 0.5 Gm (1 tab or teasp.)/20 lbs of body weight initially; then 0.25 Gm/20 lbs *b.i.d.* Maximum dose should not exceed 75 mg/kg/24 hrs.

Supplied: DS (double strength) tablets, 1 Gm sulfamethoxazole; Tablets, 0.5 Gm sulfamethoxazole; Suspension, 0.5 Gm sulfamethoxazole/teaspoonful.

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Gantanol® (sulfamethoxazole)Roche®

Basic therapy with even more convenience and economy:
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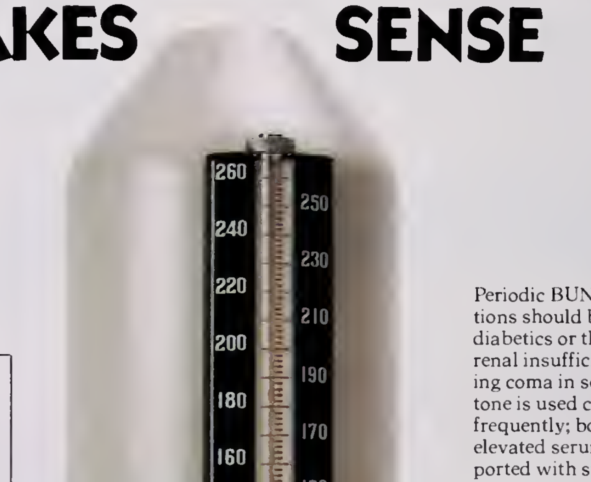
DYAZIDE®

Each capsule contains 50 mg. of Dyrenium® (triamterene, SK&F Co.) and 25 mg. of hydrochlorothiazide.

MAKES SENSE



Before prescribing, see complete prescribing information in SK&F Co. literature or PDR. A brief summary follows:

* Warning
This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* **Indications:** When the combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium sparing action of triamterene is warranted. (See Box Warning.) Routine use of diuretics in healthy pregnant women is inappropriate; they are indicated in pregnancy only when edema is due to pathological causes.

Contraindications: Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K$^+$ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K$^+$ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K$^+$ frequently; both can cause K$^+$ retention and elevated serum K$^+$. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis.

'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

FOR LONG-TERM CONTROL OF HYPERTENSION.* SERUM K$^+$ AND BUN SHOULD BE CHECKED PERIODICALLY. (SEE WARNINGS SECTION.)

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Interview

An Interview with Dr. George B. Martin

AMA Delegate and Past President of the Minnesota State Medical Association

Interviewer: *Dr. Martin, you are an AMA delegate, and you have just returned from the AMA Meeting in San Francisco. What was the makeup of the Minnesota Delegation to the AMA?*

Dr. George Martin:

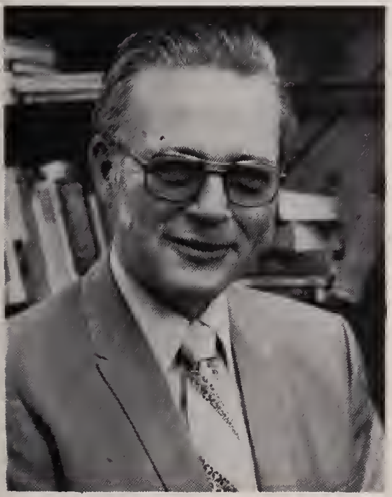
The Minnesota State Medical Association elects five delegates and five alternate delegates to the AMA. That is ten people. Also at the meeting, we have the President, President-Elect, one of the Councilors, four or five staff people to help us organize and supply what we need. We are usually fortunate enough to have anywhere from four to ten students who are members of the AMA from Minnesota. These students are helped to get to the meeting by the Ramsey and Hennepin County Medical Societies and the State Association.

We usually also have three or four residents from Minnesota who are there. Incidentally, one of the residents who was there was Ian Jones, who is president of the Zumbro Valley Medical Society, and a delegate to our Minnesota House of Delegates. He also happens to be the delegate to the American Medical Association for housestaff. This delegation usually runs about 15-20 people, and since North and South Dakota are one delegate states; they usually have one or two people there, who meet with us.

So the delegation often reaches up to 20 people who are there trying to conduct the business. That may sound like a lot of people at a convention, but when you stop to think that every year there is more and more to do, it really is not enough.

For instance, we covered 137 resolutions and 40 reports of the Board of Trustees and Councils, and by the time you put them into subject areas, it was something in the neighborhood of 70 and 80 subjects that were considered as business of the House of Delegates and disposed of one way or another. Some were disposed of positively and some were rejected; some were altered and referred, but each one of those subjects was touched upon and discussed.

This is a tremendous load, and we never get done before 1:30-2:00 o'clock on Thursday which is the fifth day of the convention. It means that we are working from 7 o'clock in the morning until usually around 7-8 o'clock at night. Good solid physician days.



Interviewer: *So there is homework and floorwork. How much time do you spend on the floor, actively or inactively with the other delegations and how much time do you spend preparing for these sessions?*

Dr. Martin:

Sunday, we meet as a caucus from 9 until 2, and then from 2 until 5 on the floor of the House for the formal openings and introduction of business. All day on Monday, starting at 8:30 in the morning and seldom getting done until 5:30 or 6 o'clock in the evening. Reference Committees break these things down by subject areas, and testimony from any member of the AMA, delegate or non-delegate, is accepted at these Reference Committees. The Reference Committees then go back and write a report.

Starting Tuesday morning at 10 o'clock and running until 5 or 6 o'clock, we discuss Reference Committee Reports and have the actual deliberations on what is to be done.

Wednesday, we start at about 8 or 8:30 and we go on 'til 4. Wednesday evening, the new president is installed, and his reception is held so that there is nothing else scheduled.

Thursday, we started at 8 o'clock in the morning discussing Reference Committee reports and the elections, and we adjourned at one of the earliest times I remembered in the last nine years at 1:30 p.m. Often times it goes on until 2 o'clock or 3 o'clock. Each morning we meet as a delegation from 6:30 or 7 'til the House convenes.

Interviewer: *Could you give us a brief biographical sketch and account of the philosophy of the new president?*

Dr. Martin:

John Budd is a family practitioner from Ohio. Has been on the Board of Trustees for six or seven years now. He is a scholarly, quiet gentleman who plays a mean ragtime piano in his off hours, has an excellent grasp of the Association's policies and functionings because of his long experience with the Association. He is soft spoken and kind; he is not weak. I think the Association is in good hands.

Interviewer: *Do you think he will handle the media well? After all, these are going to be controversial times for the next two years.*

Dr. Martin:

I don't think John Budd will be misunderstood by the media; I cannot state that he will always be quoted correctly by the media. John Budd is not in the habit of saying things that can be taken two ways. He usually is clearcut, and in his own way, forceful. We will have to see how the media treats him.

Interviewer: *Would you give us your impressions of what went on there?*

Dr. Martin:
Let's start with the Secretary of HEW's, Joseph Califano, address before the House of Delegates. At the beginning of his remarks, he said he and the AMA physicians probably would not agree with each other, but would maybe not disagree as much as we had anticipated. I disagreed more than he felt I would.

His prime thesis was the "health care industry," a term that bogles my mind, suffers from lack of competition. And this lack of competition causes escalating costs, even though technology has changed.

I think he fails to realize there is competition in this amorphous health care industry. The competition is to continue to give the American public a better and better product every day and have it available in almost every place in the country. And when that happens, yes, you do get some duplication, and yes, you do get escalating costs. There are probably areas where these can be trimmed and be more appropriate, but the competition is there.

We do not compete against each other to trap patients, solicit patients, by doing a cut rate job.

The technology in the health care industry means a new product which is different, and therefore in an era of inflation in the general economy it is more expensive than what it replaces. In most major industries, competition and technological advances have a tendency to field a product or service in a different, cheaper, more cost effective way. So far in the health care industry, technological advances have not allowed us to do something cheaper. Most of the new technology has allowed us to do things better, but has not yet reduced costs.

Interviewer: *So you think his analogies are awry: he is comparing competition in private industry, which provides a product, to competition in medicine, which provides a service. And the two are not comparable?*

Dr. Martin: No.

Interviewer: *Did Califano suggest specific ways to engender more competition?*

Dr. Martin:
No. But you are aware, of course, about Federal Trade actions on the relative values indices. The FTC thinks these indices make prices go up, which is not true. The indices do not have that much to do with the cost.

Aside from competition, Califano really came down hard, I thought, on cost controls. He said that soon the Government would

not allow us to spend any more money. And that, to me, is rationing. If you are going to ration the money that goes into the health care institution, you are going in fact to have to ration the care that comes out of it.

Interviewer: *Dr. James Sammons of the AMA said Califano seemed more interested in controlling costs than in upgrading quality. Would you agree?*

Dr. Martin:

Absolutely. If you control the costs, you are controlling the amount of service that can be delivered. If you control the amount of service that can be delivered, you can control it in two ways: total amount or the excellence of the service. Those are the only two ways you can do it.

Interviewer: *Dr. Sammons, also, commented on his fear of bureaucracy, and I am quoting here: "Governmental bureaucracy . . . is a cancerous, relentless, mindless blob of a force. As soon as you stop it in one direction, it creeps up on you in another." Do you have that same feeling?*

Dr. Martin:

I think that is an apt description, because when you are dealing with a blob, you always find yourself in the middle of it. So, indeed, wherever you push it, it is going to push you from the opposite direction. It is an encompassing cloud.

Interviewer: *Let me try another analogy on you. The Governor of California, Jerry Brown, compared Government bureaucracy to a squid. Everytime you approach a squid, it squirts black ink to hide itself, thus defending itself from its enemies.*

Dr. Martin:

Governor Brown forgot to say the black ink is usually red ink and in triplicate.

Interviewer: *Did you gather from Califano's remarks that he wants to impose comprehensive national health insurance on us soon, say within the next year or so?*

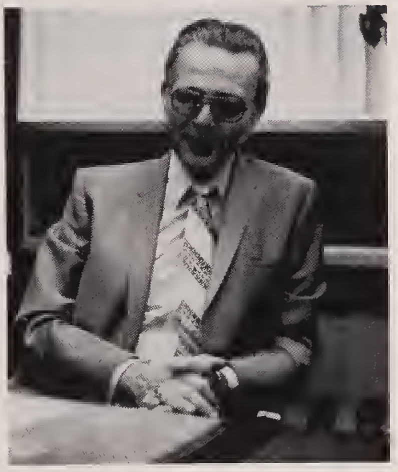
Dr. Martin:

I am sure that the Secretary and the President would like to be able to do that. So they said in their campaign speeches. Two things are

holding them back: (1) Their pledge to balance the budget. The state of the economy will not let them balance the budget and introduce national health care, and (2) the presence of the AMA in places where the decision is going to be made. Some physicians feel that because the AMA has a bill in the Congress, presently called HRA 1818, that the AMA is playing a dangerous game. They forget one thing . . . this is today . . . not ten years ago. If the decision on national health care is going to be made, it is going to be made in the Halls of Congress. It is going to be influenced upon by the AMA's philosophy, by the White House's philosophy, by Health, Education and Welfare's philosophy, by Common Cause, by the labor unions, and by national opinion.

But the decision is going to be made in Congress. Congress has gentlemanly rules for the conduct of its business, and those rules are that if you want to play the game be a participant; you have to be at the table, and you have to be at the table with a concrete bill.

Now many physicians feel we don't need a bill to play the game. The Congress, on the other hand, is determined you have to have a bill to play the game. Since the decision is going to be made in Congress, and since every patient in this country has a stake at what comes out of this decision, the AMA has got to be a full fledged, regularly acknowledged, experienced participant in that game. If we are not, I think the game is lost.



Interviewer: *Did most AMA members at San Francisco approve of the bill? Or was there a floor fight?*

Dr. Martin:

Many AMA members are uncomfortable and opposed to this type of bill but the House of Delegates voted 2½ to 3 to 1 for the bill. That bill is based on these 17 principles:

TABLE

Principles Dealing with Health Care Legislation

1. Comprehensive coverage for entire population
2. Premium subsidy and cost sharing
3. Varied sources of funding, private and public
4. Minimum federal dollars
5. Minimum federal administration
6. Freedom of choice
7. Preservation of physician/patient relationship
8. Pluralism
9. Continuity of benefits
10. No Social Security financing
11. No Social Security administration
12. State licensure and certification
13. Quality controls
14. Cost controls
15. Coverage under the AMA program would be furnished by private insurers on a risk and underwriting basis
16. Coordination of benefits
17. Separation of medical and institutional components of expense

The bill recommends the private insurance companies as carriers. After all, private insurance companies who sell health insurance are the ones that the physician and the patient deal with primarily. The physician then receives his pay from the patient through the insurance company. This is the only way we can maintain a kind of pluralism where the physician can be a private practitioner and deal with his patient only.

Interviewer: *Did Califano comment on the AMA plan? Or did he just ignore it?*

Dr. Martin:

He mentioned it in passing. But the bill involves principles that close to a quarter of the Congressmen now are sponsoring with us, and our numbers are increasing all the time. I am sorry I can't remember the exact number, but every year we have had a bill in, we have more congressional support than any other single bill, including any bills that have been presented by the White House.

Interviewer: *Did the AMA delegates take any other specific actions that physicians of Minnesota might want to know about?*

Dr. Martin:

Several. First, there was a resolution and report which suggested that the AMA House of Delegates quit electing its president and make the Chief Executive Officer, Dr. Sammons, permanent President of the AMA. This was unpopular with most delegates. They feel that physicians of this country should continue to elect the President of the AMA. His role may need to be defined. He might probably be required to serve for a longer period than one year. This has not been decided, but it came out loud and clear that AMA members want to elect their own president.

It also came out loud and clear that we need one single, identifiable spokesman who is on a continuing basis so that he can relate to his counterparts in business and government, and it could well be that several titles are going to be changed. The chief executive officer will become more and more the single, clearcut voice for American medicine, while the physicians are not going to have to give up their prerogative of electing one of the peers to serve as president.

Interviewer: *Will the Chief Executive Officer be salaried?*

Dr. Martin:

It will be a full-time, salaried position serving at the pleasure of the Board of Trustees of the American Medical Association. This is all fuzzy right now. We don't know right now exactly how it is going to work out, but this would seem to be the direction which is developing.

There was one other thing that I think was interesting. A young man by the name of Mangol, a resident in plastic surgery in Texas, ran as a candidate for the Board of Trustees. He was in the elective process all the way down to the last ballot. By only a very few votes, he lost his bid to Dr. Cole from Texas. The fact that he came close is important, but more important, he was an accepted, knowledgeable, expert candidate who was highly qualified and who had no qualms about running. He received support from the youngest to the oldest physicians who were there. He ran a dignified campaign, and to me it signals the house staff feels that they are now a functioning part of organized medicine at the AMA level. Nothing can please me more.

Interviewer: *Are you telling me that there is an AMA youth movement? Just a few years ago, young physicians thought of the AMA as a band of old foggies suffering from hardening of the categories. That's changed?*

Dr. Martin:

It is changing rapidly. And Minnesota should be proud: it was one of the instigators of the change. Our future is now part of us. Young physicians have found their contributions are just as important as ours. They don't have the wisdom from having been there a long time, but too long a service can lead to hardening of the categories. If you are not challenged, you stagnate.

The young physicians are bringing in new and young ideas, and many of these ideas are catching hold and are becoming policy. The mere fact that the young AMA members could comfortably conduct a good campaign with a good, qualified person was one of the brightest things that happened.

Interviewer: *Was there much talk at the AMA about the malpractice problem? The successful countersuits by physicians?*

Dr. Martin:

At this session there was not much talk about malpractice litigation, new programs, for the simple reason that there have been many changes in many states. The track record is not clear, and so there is a hiatus until legal trends crystalize in one direction. I would expect more changes at the interim meeting in December, and more discussion. Right now we are in the spot where we don't have much to say. We have to wait and see.

Interviewer: *As you very well know, Minnesota is considered an innovative state in medical politics because of its young talent, its new Socio-Economic Division, and its new Cost Containment Commission. You are chairman of the Ad Hoc Committee to reorganize the State Medical Association's structure. Given these facts and your position, how did you feel Minnesota measured up to the other states at the national convention?*

Dr. Martin:

I think we measure up ahead of most of them, and certainly are not surpassed by any. The reorganization in our state has already been causing ripples in the AMA and is now diffusing to other states.

I refer primarily to our organizing a Socio-Economic Division. And particularly our approach to the Health Planning Law: #PL 93-641.

There were on the floor of the House several referrals to the way that medicine should cope with the Health Planning Law. Minnesota's way was mentioned over and over again, and a resolution was passed which asked the AMA to develop a leadership role in disseminating the information about how to accomplish a relationship to the Health Planning Act.

I am sure that Minnesota's plan is going to spread, because that was the first step in our reorganization.

But it is obvious to us the Socio-Economic Division is just a first step in reorganizing the State Association. We have to finish the job so that the entire association structure would be able to better relate to today's problems, and to the physicians in this state. Basically, at the last House of Delegates Meeting in Minneapolis in May, the delegates accepted approximately 40 points, which paint the broad picture of what is going to happen.

First, the name of the Association will be changed to: Minnesota Medical Association. The "State" in the name has confused many people. They think we are a part of government, because we have "State" in our name. The Council, which is our governing body, will be changed to Board of Trustees. There will be several committees of the Board of Trustees which will deal with broad areas, and there will be three Councils developed, one of them already is the Socio-Economic Council.

The Scientific Affairs Council, which is most important, because there we have representatives for every designated specialty in the State of Minnesota, and they will now become an integral part of our functioning, so their concerns of socio-economics, and their concerns about health and medicine, will be under the umbrella of the State Association, and therefore make us all that much more effective.

The third council will be the Council on Education, which will be a broad one because there are educational and informational tasks that need to be done throughout the Association.

With this reorganization, the physicians in this state will be getting more for their dues dollar. They will be able to have an association that helps them to relate not only to government but to all the other bureaus and agencies, as well as being able to take time out to actually do concrete planning of our own.

We are not always going to be reacting to everybody under the sun when they come with an idea; we are going to start to have good ideas of our own, generated from the medical community. We believe, in the best interests of the people of this state, foresighted physicians should organize in a way that enhances the health of this state.

Interviewer: *Speaking of new ideas, how did the Cost Containment Commission come to be?*

Dr. Martin:

It came to be because physicians in the State Association leadership roles were quite aware that cost is an important thing; that costs are running too high; that there has to be some specific attention paid to the cost of care by the populace of the state. The only way to control this escalation is to get together a cross section of people who are knowledgeable and who are willing to sit down and knock heads together. The Cost Commission has a cross representation of all spheres of industry, occupations, and consuming public. We have to do it that way so that everybody feels they are participating. We know that the results of this Cost Commission may not tell the Medical Association what it wants to hear. We may not agree with the Commission's findings. But problems are there, and we have caused some of them. We cannot go on ignoring them. We have to make decisions about what we are going to do about them.

Interviewer: *Would you say there is a growing consensus among the leadership of the Minnesota State Medical Association that we must look outside the association rather than dwelling on the problems in the inside?*

Dr. Martin:

If you always talk to your friends, you never know who your enemies are.

Interviewer: *Could you tell us in simple, concrete language how the Association plans to deal with the Health Service Agencies?*

Dr. Martin:

Basically, this comes under the Division of Socio-Economics Affairs. What we have done with the Health Planning Law is to create parallel physician committees. Let's say a Health Planning Agency is dealing with perinatal guidelines. Within 36 hours, our office will

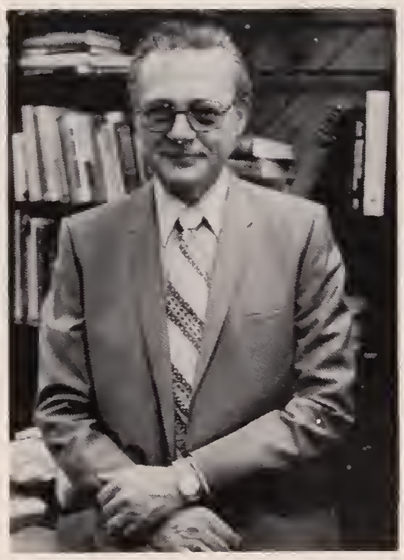
call 400 physicians in the Metropolitan Area whose expertise is perinatal care, so we can come together and go over the entire plan point by point and put our knowledge into the health planning process. This should occur before we are presented with a document that tells us what we are going to have to do. Before an agency adopts a document, it will have the distilled attitude of 400 practicing physicians. This approach changes planned documents greatly, and it makes the final document workable.

The same thing will happen with almost every other major agency and governmental force. We want to organize so that we have experts who parallel their experts, and we are getting the staffing to help us do this. This is the way we have to relate. We have to relate early at the planning stage so that they know what good medical care is before they try to tell us how we are supposed to deliver it.

Interviewer: *Having a point-by-point alternative program to counter the agencies and the Legislature, must require more staff support.*

Dr. Martin:

There is no doubt about it. If we don't have the staffing, we've got nothing except knowledgeable physicians who have always been over generous in their time, but they don't know what to do. They don't know where to go. They are busy all day, and they can't afford time out every day of the year. We have to have staff that brings it together, that is able to represent us at a lot of daytime meetings, and who knows how the planning process works, gets to know its counterparts in the other agencies so there is a spirit of cooperation at the staff level, because most of these things are done by staff too.



Interviewer: *I have read the fastest growing parts of Congress are the staffs of those senators and representatives. In a small way, you are adopting the same tactics.*

Dr. Martin:

Yes, but fortunately, our staff people have more knowledgeable volunteers to call upon than staff people in the Congress or in Health Planning Agencies. Our staff people have physicians available who know how to practice medicine, and when they say this is good medicine and this is not good medicine for people, they know what they are talking about. So we may be outstaffed, but the resources that our staff has to call upon are superior.

Interviewer: *They may be working bigger, but we are working smarter. Right?*

Dr. Martin: Right.

Interviewer: Dr. Richard L. Reece
Photographer: Dr Farrell Stiegler

MINNESOTA MEDICINE's Best of the Year

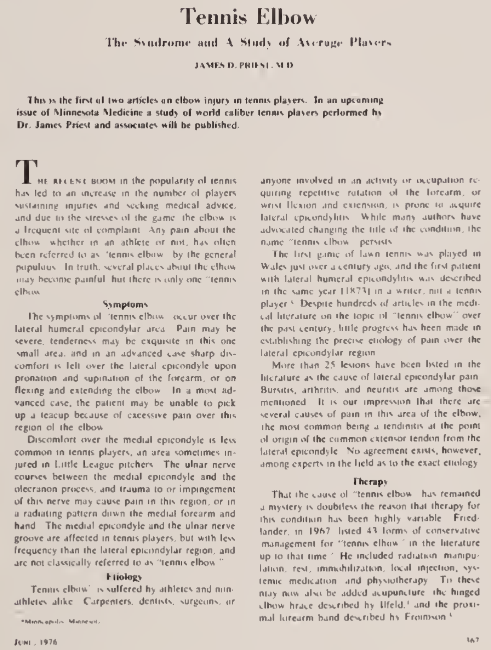
Each Spring the Board of Editors announces its choices for the best scientific/original article and best cover for the previous year. The winners for 1976 are:

Best Cover: "The Christian Radich"

minnesota medicine
STATE MEDICAL ASSOCIATION
NOVEMBER 1976

"The Christian Radich" November 1976 issue of MINNESOTA MEDICINE by *Gerald E. Cotton, M.D.*, Assistant Professor of Clinical Sciences, University of Minnesota Medical School, Duluth.

Best Article: Tennis Elbow



Tennis Elbow

The Syndrome and A Study of Average Players

JAMES D. PRIEST, M.D.

This is the first of two articles on elbow injury in tennis players. In an upcoming issue of Minnesota Medicine a study of world caliber tennis players performed by Dr. James Priest and associates will be published.

The recent boom in the popularity of tennis has led to an increase in the number of players sustaining injuries and seeking medical advice, and due to the stresses of the game the elbow is a frequent site of complaint. Any pain about the elbow, whether in an athlete or not, has often been referred to as "tennis elbow" by the general populous. In truth, several places about the elbow may become painful, but there is only one "tennis elbow."

Symptoms

The symptoms of "tennis elbow" occur over the lateral humeral epicondylar area. Pain may be severe, tenderness may be exquisite in this one small area, and in an advanced case sharp discomfort is felt over the lateral epicondyle upon pronation and supination of the forearm, or on flexing and extending the elbow. In a most advanced case, the patient may be unable to pick up a teacup because of excessive pain over this region of the elbow.

Discomfort over the medial epicondyle is less common in tennis players, an area sometimes injured in Little League pitchers. The ulnar nerve courses between the medial epicondyle and the olecranon process, and trauma to or impingement of this nerve may cause pain in this region, or in a radiating pattern down the medial forearm and hand. The medial epicondyle and the ulnar nerve groove are affected in tennis players, but with less frequency than the lateral epicondylar region, and are not classically referred to as "tennis elbow."

Etiology

"Tennis elbow" is suffered by athletes and nonathletes alike. Carpenters, dentists, surgeons, or anyone involved in an activity or occupation requiring repetitive rotation of the forearm, or wrist flexion and extension, is prone to acquire lateral epicondylitis. While many authors have advocated changing the title of the condition, the name "tennis elbow" persists.

The first game of lawn tennis was played in Wales just over a century ago, and the first patient with lateral humeral epicondylitis was described in the same year (1873) in a writer, not a tennis player.[1] Despite hundreds of articles in the medical literature on the topic of "tennis elbow" over the past century, little progress has been made in establishing the precise etiology of pain over the lateral epicondylar region.

More than 25 lesions have been listed in the literature as the cause of lateral epicondylar pain. Bursitis, arthritis, and neuritis are among those mentioned. It is our impression that there are several causes of pain in this area of the elbow, the most common being a tendinitis at the point of origin of the common extensor tendon from the lateral epicondyle. No agreement exists, however, among experts in the field as to the exact etiology.

Therapy

That the cause of "tennis elbow" has remained a mystery is doubtless the reason that therapy for this condition has been highly variable. Friedlander, in 1967, listed 43 forms of conservative management for "tennis elbow" in the literature up to that time.[2] He included radiation, manipulation, rest, immobilization, local injection, systemic medication and physiotherapy. To these may now also be added acupuncture, the hinged elbow brace described by Ilfeld,[3] and the proximal forearm band described by Froimson.[4]

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*Minneapolis, Minnesota.

June, 1976

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"Tennis Elbow" by James D. Priest, M.D., Minneapolis Orthopedist. Published in June 1976 issue of MINNESOTA MEDICINE.

Gerald E. Cotton, M.D. (left); Richard L. Reece, M.D. (Editor-in-Chief); James D. Priest, M.D. (right).

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(Continued to page 614)

Gerontology

Depression in the Aging Patient

FRANCIS A. TYCE, M.D.

THE TERM "SENILE patient" is a misnomer and should be avoided. We are a hedonistic society and the depressive state is the antithesis of our general life style. We are also youth oriented, and aging is no longer considered graceful. In our culture senility is synonymous with silliness, and is a pathological state.

We all age differently, some more quickly than others. The purpose of this paper will be to consider this disorder in those patients who have physical and psychological symptoms of aging. In my experience depression in this group is relatively common.

At the Rochester State Hospital, it is estimated that one-third of patients sixty years old and over who are admitted have symptoms of depression. Dr. John Donnelly of the Institute of Living, a private psychiatric facility has made the same observation at that hospital. The number of patients with depression sitting alone at home in nursing homes and in board and care homes, must be considerable, because the condition is frequently misdiagnosed and most often undiagnosed, and therefore neglected or mismanaged.

Depression in the aging patient has a number of characteristics:

1. It is common.
2. It is different phenomenologically than in younger patients.
3. It is intensely painful.
4. It is not always easy to recognize.
5. It is treatable *but* not always well treated.

The stumbling block to an appropriate diagnosis is the term "Organic Brain Syndrome." Once labeled, the aging patient is treated differently, by his family, and particularly by health care professionals. The medical profession seems to tune out the aging patients' cries for help, seeing them only as expressions of an aging brain—a condition both progressive and untreatable. On the other end of the spectrum of life the pediatrician would not so easily abandon the slowly maturing but uncommunicative infant, but would use all the signs and sources of data to arrive at an appropriate diagnosis and methods for relief of the infant in distress.

Aging is a gradual process. Apart from the physical effects, there are psychological effects. Sight, hearing, memory, judgment, language, and the cognitive processes begin to lose their sharp edges, perceptual input becomes blurred even as the patient's ability to handle this information centrally is failing. The end result is that the patient slowly loses his grasp of reality in the daily experience. He may substitute fantasy for fact, turn in upon himself, act strangely, show agitation, restlessness, or sit immobile, uncommunicative, in a state of psychological paralysis. Any of these states can be accompanied by or be manifestations of severe depression.

In younger depressed patients histories are more quickly obtained; or, if the younger patient is so depressed that talking is difficult, excellent secondary sources of information are available in the immediate family. In the aging patient family may be absent, and the only source is often the nursing home staff who have sent the patient to hospital because he is "difficult, obnoxious or threatening to the staff." Prior to hospitalization, the nursing home staff may have tried to control the patient's behavior with medication usually given by telephone by successive doctors, who prescribe successive drugs, whose cumulative effect may be to further decrease the patient's already tenuous hold on reality and thus to worsen his behavior.

The younger patient can well describe depressive feelings, agitation, anorexia, sleep disturbance, and loss of interest—the cardinal signs of depression. The aging patient may not be able to do this. Memory, vocabulary, and the ability to describe feelings may be affected by the aging process and we may have only our observations of the patient's behavior and the scanty information from secondary sources to help us. If the patient is still with the family, information regarding changes in mood and behavior will be good. If the patient lives alone, the only informant may be the neighbors or the visiting nurse. If the patient comes from a nursing home, the information may be good, or the nursing home staff may see hospitalization as terminating their relationship with a "difficult patient," and immediately fill his bed from their waiting list.

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*Rochester, Minnesota.

Regardless of how the depressive state is labeled, Reactionary Depression, Endogenous Depression, the Depressive Phase of a Manic Depressive illness, or acute or chronic depression it has a certain commonalty in all patients of all ages. Although it may differ in degree and the length of the experience, there is a central core of misery, a sense of isolation, unworthiness and hopelessness. Whenever present to a marked degree, it is almost palpable to the observer. The depressed patient may wear it like a cloak, and indeed all have seen the dull and sombre clothes some depressed women wear when seen on admission, and how color and ornament return as they respond to treatment. Depression can occur in anyone irrespective of age, sex, social group or ethnic origin.

As physicians we must listen not only to the content of the patient's message, but also the context, and the accompanying feelings. The information, however, is available only if the physician asks the right questions. Most patients find this inner depressive experience difficult to describe. They may couch it in somatic language to their physicians: "I hurt, my chest aches", in religious doubt, despair, and guilt to their clergymen: "God has foresaken me; In infantile, dependent, irritable language to their family: "I need you, I hate you," or they may not talk at all but rather withdraw into themselves.

The changes in behavior in the aging patient associated with depression are restlessness, agitation, crying, irritability, anorexia, poor sleep, loss of previous interests such as reading, watching T.V., or visiting with other patients, a whining voice, a sad expression, clutching at people who pass, and withdrawal—which can become almost complete so the patient neither talks nor moves from her bed or chair without nursing intervention. Visualize the 80 year old lady previously the pet of the nursing home, who now sits in her wheel chair shouting, "Help! Help!" or "Death! Death! Death!" or Don't! Don't! Don't!" or "Give Me! Give Me! Give Me!" In each case senility or organic brain syndrome, may be the label, but the primary message is one of desolation, of depression and of an intensely painful experience which the patient can but imperfectly express.

Treatment

The treatment parameters are simple. That which works with younger depressed patients, also works with the aging patient with one proviso. The treatment modality used must be modified because of the patient's age. If anti-depressants drugs are used, smaller doses are given with 50% of the total daily dose administered at night after the patient is in bed. This will avoid any falling due to hypotensive reaction to the drug and also reduce the need for night-time sedation. If electroshock therapy is used and age is no contra-indication, unilateral electroshock is preferable since it produces less confusion. During treatment, the muscle relaxant must be adequate so bone fragility does not present a problem during the modified convulsion.

If the aging patient is in good mental contact—and the psychodynamics indicate it—individual psychotherapy can be used to help the patient try and work through the depressive phase. It is well to remember that in the aging patient, though frank signs of physical and psychological aging are present, the patient's basic personality structure remains intact, unchanged—though it may be masked or distorted by the aging process. If the patient were a passive dependent person in younger days, he will remain so, but be seen as a clinging, demanding patient by the nursing home staff. If the patient was a ruggedly independent person all his life, he will remain so—but be seen as difficult, cranky by the nursing home staff, as he resists their efforts to help or fuss over him. If the patient were always somewhat aloof or suspicious of others when younger, the staff may see him as paranoid in later life.

The bipolar swings of manic depressive illness can continue through life. Lithium Carbonate is as effective in the elderly as it is in younger patients. Again smaller doses must be used, and with the older patient cardiopulmonary and renal signs of toxicity must be monitored closely, even with small doses and low serum levels of the drug.

Reasons for Hospitalization and Admission

1. A deep depression in terms of its effects on daily activity.
2. A risk of suicide. Has the patient expressed

suicidal thoughts and feelings or made any suicidal attempts?

3. A history of previous severe depressive attacks, particularly with suicidal attempts by the patient.
4. A history of depressive attacks and suicide in the patient's family.
5. If the patient lives alone, or lacks family to provide supervisory care while the depression is being treated.
6. The necessity of removing the patient from factors contributing greatly to his depression, such as adverse marital family or work situations.
7. Possible co-existing and contributory physical disease which would benefit from concerned medical care.
8. When the depression is producing physical decline in the patient such as weight loss, or dehydration.
9. In Manic Depressive illness, when it is intended to stabilize the patient on Lithium Carbonate for the first time.
10. When there exists the distinct possibility the patient will need electro-shock treatment, since this treatment is best administered in the hospital.
11. When depression presents as a possible cause for behavior change in the physically frail and aging patient.

Where the degree of depression is great and increasing, and when the patient does verbalize self-destructive ideas, the physician should insist on hospitalization. If the patient refuses or is too depressed to make a decision, family pressure should be used to persuade the patient to enter hospital. If the family is unsuccessful, they should be told how to obtain hospitalization by legal and court procedure. Most states have a mechanism for an "Emergency Admission Order" whereby a patient can be admitted to a psychiatric hospital without his consent, and treated, on the signature of two physicians who have seen the patient and can demonstrate that the patient is in imminent danger of harming himself. This order is for a limited time only, two or three days, but it allows the patient to be protected, and provides the family enough time to initiate the court procedure. Most patients, regardless of the depth of the depression, once brought to the hospital, will remain there voluntarily.

My last point deals with economic effects of undiagnosed and untreated depression. Patients can experience severe financial loss in their quest for relief.

Case Reports

Case 1

This lady was brought to hospital by her sister who had a depressive illness which responded well to treatment. The sister demanded we admit the patient, claiming she was depressed. The patient was fifty, a marketing executive in a large chain firm. She had dark circles under her eyes, a woe-begone expression, a most distressful whining voice and complained there was nothing wrong with her except painful feet. She also wore a wig and underneath had a foul smelling scalp dermatitis. The orthopedist could find nothing wrong with her feet. The patient reported she had had 44 hospitalizations and 11 surgical procedures within the last ten years. All the surgical procedures were elective. The number of medical contacts she must have had to generate 44 hospital admissions must be numbered in the hundreds. She had exhausted her medical insurance coverage and though she had a well paid job she had never had a vacation, her money going to pay for her medical expenses.

On further questioning, it developed this lady's troubles had started ten years ago when her husband abandoned her while in hospital having his baby. She referred to her husband as "dead" but in effect he had just walked out and she never saw him again. Her depressive symptoms started at that time and became more severe a year prior to this hospital admission on the death of the son in a car accident. This patient agreed she was depressed but only secondarily to her painful feet. Confrontation and antidepressant medication were ineffectual, and she was treated with Electro Convulsive therapy and made an excellent recovery.

Case 2

A 45-year-old lady, wife of a farmer, was brought to the hospital by her daughter and husband who came along because it was evident he was completely intimidated by his wife. The daughter, a student nurse, had insisted on bringing her mother. According to the daughter, the patient had over the last three years been absolutely impossible to live with. She was irritable all the time, found fault with the daughter daily (she finally threw her daughter out of the house) and became increasingly obnoxious to her husband. He continuously tried to please her which irritated her more and more. She found fault because he worked too hard. When he worked less, she called him lazy. She complained about his parsimonious concern with money—she felt they had worked all their life for nothing and their money was just sitting in the bank. So she bought two new cars and a new pickup, and also two tickets for a two-week vacation to Hawaii. She told her husband he could come —but if he didn't, she was going anyway. To please her he went. It was the most miserable two weeks he had had in his life. His wife complained the whole time, loudly in front of everyone and embarrassed him continuously. Finally the wife literally threw the tour guide director off the bus, because she didn't like the particular route he had taken that day.

The daughter had tried innumerable medical contacts without success. She turned to her text books and decided that her mother had "Involutional Melancholia" (in her own words) and brought her physically to the hospital. We agreed with the daughter's diagnosis. The patient responded well to treatment, and has continued well during outpatient follow-up.

Case 3

The first contact with this lady was made when her married children called and said they had to talk to someone about their parents. The elder son, as spokesman for his brother and two sisters, said that unless something was done about their parents the only solution was a divorce. They were continuously fighting and bickering and making each other's life a hell. The parents had been married 44 years.

Both parents and the children were seen together. The picture was unclear. The husband seemed paranoid, the wife depressed. The husband was admitted, and studied for one week. Following his release from hospital, the wife was admitted. No real paranoia was noted in the husband but a story of personality change in the wife was noted going back four years prior to her admission. At that time the wife began to become more and more concerned about money—"who would look after her if she became sick and who would support her in her later years if she had to enter a nursing home." She was working and began to keep her financial affairs secret from her husband. In effect she was hoarding her money. Three years before admission, she fell over on her back injuring her neck, left shoulder, and left arm while at work.

On admission to hospital she complained of pain in her neck, left shoulder and left arm. She had had pain continuously since the accident, for which she had had continuous medical care over the last three years. She consulted with neurologists, specialists in physical medicine culminating in her referral to a Pain Clinic and finally she had treatment by acupuncture. On admission to our hospital she complained only of the pain and carried her left arm with her right hand as in a sling.

The patient looked severely depressed. She had crease lines in her forehead between her eyes and looked mournful and woe begone. She whined when she talked and said that "yes, maybe she was depressed but who wouldn't be with the pain she had in her neck, left shoulder and left arm." Her previous medical history revealed that nothing specific had been found, but presumably the pain was related to the accident.

Careful exploration of the past with the patient and her husband revealed that prior to the accident she was becoming inordinately concerned about herself and her future. She became fearful that she would get sick and would be abandoned and there would be no one to look after her. It was then she started to keep her financial affairs secret from her husband. She became morose and gave up her social contacts. Previously she had always enjoyed life, now she was always miserable. The husband's efforts to "snap her out of this mood" only made her more and more irritable. His encouraging her to get out of the house made her angry.

As a consequence of the accident the Insurance Company stepped in, paid her a bi-weekly allowance in lieu of wages and paid her mounting medical bills and finally settled for a large sum of money—but also were committed to all her future medical bills for the pains in her neck, left shoulder and left arm. In other words, they agreed to continue to look after her as long as she stayed sick. But the symptoms, which she had had prior to her accident were, in reality, the expression of her depression.

From the above it should be evident the toll taken by depression economically, culturally and socially, is staggeringly high. Yet, paradoxically, the picture is one of hope. This is because for the first time in history we have available a sophisticated array of treatment. Not least among these are the new antidepressant drugs which can be used after a suitable diagnosis of depression is made. Since most patients are seen initially by the family practitioner or the internist, the possibility of a depression basic to the presenting complaint should always be considered.

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It has not been established whether the drug-induced lowering of serum cholesterol or lipid levels has a detrimental, beneficial, or no effect on the morbidity or mortality due to atherosclerosis or coronary heart disease. Several years will be required before current investigations will yield an answer to this question.

Contraindications

The administration of CHOLOXIN (sodium dextrothyroxine) to euthyroid patients with one or more of the following conditions is contraindicated:

1. Known organic heart disease, including angina pectoris; history of myocardial infarction; cardiac arrhythmia or tachycardia, either active or in patients with demonstrated propensity for arrhythmias; rheumatic heart disease; history of congestive heart failure; and decompensated or borderline compensated cardiac status.
2. Hypertensive states (other than mild, labile systolic hypertension).
3. Advanced liver or kidney disease.
4. Pregnancy.
5. Nursing mothers.
6. History of iodism.

Warnings

CHOLOXIN (sodium dextrothyroxine) may potentiate the effects of anticoagulants on prothrombin time. Reductions of anticoagulant dosage by as much as 30% have been required in some patients. Consequently, the dosage of anticoagulants should be reduced by one-third upon initiation of CHOLOXIN therapy and the dosage subsequently readjusted on the basis of prothrombin time. The prothrombin time of patients receiving anticoagulant therapy concomitantly with CHOLOXIN therapy should be observed as frequently as necessary, but at least weekly, during the first few weeks of treatment.

In the surgical patient, it is wise to consider withdrawal of the drug two weeks prior to surgery if the use of anticoagulants during surgery is contemplated.

When CHOLOXIN (sodium dextrothyroxine) is used as thyroid replacement therapy in hypothyroid patients with concomitant coronary artery disease (especially those with a history of angina pectoris or myocardial infarction) or other cardiac disease, treatment should be initiated with care. Special consideration of the dosage schedule of CHOLOXIN (sodium dextrothyroxine) is required. This drug may increase the oxygen requirements of the myocardium, especially at high dosage levels. Treated subjects with coronary artery disease must be seen at frequent intervals. If aggravation of angina or increased myocardial ischemia, cardiac failure, or clinically significant arrhythmia develops during the treatment of hypothyroid patients, the dosage should be reduced or the drug discontinued.

Special consideration must be given to the dosage of other thyroid medications used concomitantly with CHOLOXIN (sodium dextrothyroxine). As with all thyroactive drugs, hypothyroid patients are more sensitive to a given dose of CHOLOXIN (sodium dextrothyroxine) than euthyroid patients.

Epinephrine injection in patients with coronary artery disease may precipitate an episode of coronary insufficiency. This condition may be enhanced in patients receiving thyroid analogues. These phenomena should be kept in mind when catecholamine injections are required in sodium dextrothyroxine-treated patients with coronary artery disease.

Since the possibility of precipitating cardiac arrhythmias during surgery may be greater in patients treated with thyroid hormones, it may be wise to discontinue CHOLOXIN (sodium dextrothyroxine) in euthyroid patients at least two weeks prior to an elective operation. During emergency surgery in euthyroid patients, and in surgery in hypothyroid patients in whom it may not be advisable or possible to withdraw therapy, the patients should be carefully observed.

There are reports that sodium dextrothyroxine in diabetic patients is capable of increasing blood sugar levels with a resultant increase in requirements of insulin or oral hypoglycemic agents. Special attention should be paid to parameters necessary for good control of the diabetic state in dextrothyroxine-treated subjects and to dosage requirements of insulin or other antidiabetic drugs. If sodium dextrothyroxine is later withdrawn from patients who had required an increase of insulin (or oral hypoglycemic agents) dosage during its administration, the dosage of antidiabetic drugs should be reduced and adjusted to maintain good control of the diabetic state.

When either or both impaired liver or kidney function are present, the advantages of CHOLOXIN (sodium dextrothyroxine) therapy must be weighed against the possibility of deleterious results.

Usage in Women of Childbearing Age

Women of childbearing age with familial hypercholesterolemia or hyperlipemia should not be deprived of the use of this drug; it can be given to those patients exercising strict birth control procedures. Since pregnancy may occur despite the use of birth control procedures, administration of CHOLOXIN (sodium dextrothyroxine) to women of this age group should be undertaken only after weighing the possible risk to the fetus against the possible benefits to the mother. Teratogenic studies in two animal species have resulted in no abnormalities in the offspring.

Precautions

It is expected that patients on dextrothyroxine therapy will show greatly increased serum protein-bound-iodine levels. These increased serum PBI values are evidence of absorption and transport of the drug, and should NOT be interpreted as evidence of hypermetabolism; similarly, they may not be used for titrating the effective dose of CHOLOXIN (sodium dextrothyroxine). PBI values in the range of 10 to 25 mcg% in treated patients are common.

If signs or symptoms of iodism develop during CHOLOXIN (sodium dextrothyroxine) therapy, the drug should be discontinued.

A few children with familial hypercholesterolemia have been treated with CHOLOXIN for periods of one year or longer with no adverse effects on growth. However, it is recommended that the drug be continued in patients in this age group only if a significant serum cholesterol-lowering effect is observed.

Adverse Reactions

The side effects attributed to dextrothyroxine therapy are, for the most part, due to increased metabolism, and may be minimized by following the recommended dosage schedule. Adverse effects are least commonly seen in euthyroid patients with no signs or symptoms of organic heart disease; the incidence of adverse effects is increased in hypothyroid patients, and is highest in those patients with organic heart disease superimposed on the hypothyroid state.

In the absence of known organic heart disease, some cardiac changes may be precipitated during sodium dextrothyroxine therapy. In addition to angina pectoris, arrhythmia consisting of extrasystoles, ectopic beats, or supraventricular tachycardia, ECG evidence of ischemic myocardial changes and increase in heart size have been observed. Myocardial infarctions, both fatal and non-fatal, have occurred, but these are not unexpected in untreated patients in the age groups studied. It is not known whether any of these infarcts were drug related.

Changes in clinical status that may be related to the metabolic action of the drug include the development of insomnia, nervousness, palpitations, tremors, loss of weight, lid lag, sweating, flushing, hyperthermia, hair loss, diuresis, and menstrual irregularities. Gastrointestinal complaints during t apy have included dyspepsia, na and vomiting, constipation, diarr and decrease in appetite.

Other side effects reported to be sociated with CHOLOXIN (sodium trothyroxine) therapy include the velopment of headache, change libido (increase or decrease), hoa ness, tinnitus, dizziness, periph edema, malaise, tiredness, visual turbances, psychic changes, pares sia, muscle pain, and various biz subjective complaints. Skin rashes cluding a few which appeared to due to iodism, and itching have attributed to dextrothyroxine by investigators. Gallstones have discovered in occasional dextroth ine-treated patients and choles jaundice has occurred in one pat although its relationship to CHOL therapy was not established.

In several instances, the previ existing conditions of the patien peared to continue or progress d the administration of CHOLOXIN (um dextrothyroxine); a worsenin peripheral vascular disease, ser um, exophthalmos, and retinop have been reported.

CHOLOXIN (sodium dextrothyroxine tentiates the effects of anticoagul such as warfarin or Dicumarol, on thrombin time, thus indicating crease in the dosage requiremen the anticoagulants. On the other dosage requirements of antidia drugs have been reported to b creased during dextrothyroxine th (see WARNINGS section).

Dosage and Administration

For **adult** euthyroid hypercholes emic patients, the recommended tenance dose of CHOLOXIN (sc dextrothyroxine) is 4 to 8 mg pe The initial daily dose should be 1 mg to be increased in 1 to 2 mg ments at intervals of not less one month to a maximum level o 8 mg daily, if that dosage level dicated to effect the desired low of serum cholesterol.

When used as partial or complete stitution therapy for levothyroxi hypothyroid patients with cardia ease who cannot tolerate other of thyroid medication, the initial dose should be 1 mg to be incr in 1 mg increments at intervals less than one month to a max level of 4 to 8 mg daily, preferab lower dosage. The maximum in pa receiving digitalis therapy is 4

For **pediatric** hypercholesterolem tients, the recommended mainte dose of CHOLOXIN (sodium dext roxine) is approximately 0.1 mg mcg) per kilogram. The initial dosage should be approximatel mg (50 mcg) per kilogram to creased in up to 0.05 mg (50 mc kilogram increments at monthly vals. The recommended maxima is 4 mg daily, if that dosage is cated to effect the desired lo of serum cholesterol.

If new signs or symptoms of c disease develop during the tre period, the drug should be with

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Editorials

Should Strict Control be the Mode of Therapy for the Juvenile Diabetic?

RECENTLY, THERE HAS been much controversy regarding the treatment of juvenile diabetes using strict insulin control. Unfortunately, the proglem is far from being solved. Patients and physicians have been confused by the doses of insulin and therefore many cases of the Somogyi effect or reactive hypoglycemia have occurred.

In a recent appearance at a Twin City Diabetic Meeting and an editorial article in Minnesota Medicine[1], Dr. Richard A. Guthrie advocated strict control using two injections of NPH and regular insulin in the morning and at suppertime. He suggested that the degree of thickening of glandular basement membrane parallels the degree of control of diabetes. Marked thickening is seen in patients with poor control, questionable changes occur in fair control, and little or no thickening is seen in children with good diabetic control.[2]

His work is quite important, but also controversial because his strict control of juvenile diabetic patients have negative urines "up to 80% of the time". Those of us who see many children with the disease question these results because of the nature of children including their changes of emotions, marked changes of daily activities, and eating habits. There are always a small group of patients who have excellent control with negative urines, but it is unlikely that the majority of children would or could fall into that category.

Dr. Guthrie's work is exciting regarding basement membrane disease, but it seems that his strict and moderate control patients are very similar. Most juvenile diabetics generally fall into his moderate control group, where on close examination of Dr. Guthrie's work the basement membrane shows very little change.

We would like perfection with strict control following as close as possible the true physiology of the body,[3] but the course of strict control is fraught with problems of reactive hypoglycemia. There is a strong possibility that it is more likely for reactive hypoglycemia to occur with two dose insulin therapy using two different insulins with each dose (NPH and regular), particularly with those unfamiliar with this form of regulation. Therefore, a less rigid system might be the best for the majority of the children. The newer insulins used judiciously to fit individual needs, striving for as good a control as possible, is perhaps more important. Control should not be so strict that reactions such as reactive hypoglycemia occur. Many children are well controlled with one dose of insulin or a combined dose of insulins in one injection. Two injections of insulin serve important use in some problems of control. A diabetic educational program regarding control and diet is also a necessity.

The burden of proof that two injections be the mode of therapy rests upon strict scientific proof that this method is justified or practical for the majority of juvenile insulin dependent diabetics.

Stanley A. Leonard, M.D.*
St. Paul, Minnesota

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*Director, Diabetic Education Program, St. Paul Children's Hospital, Clinical Professor of Pediatrics, University of Minnesota Medical School.

References

Guthrie, RA. Diabetes Mellitus, Minnesota Med, 60-4:261, 1977.
Jackson, RL and Guthrie, RA: The Child with Diabetes Mellitus Scope Current Concepts Series, The Upjohn Co., Kalamazoo, Michigan, 1975.
3. Cahill, GF, Jr., Etzwiler, DD, and Freinkel, N. Control and diabetes. New Engl J Med 294:1004, 1976.

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The House will convene November 18 and 19 at the Radisson-South, Minneapolis.

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Sexuality and Illness

An increasing number of articles in the popular and professional literature direct our attention to the area of sexual dysfunction. Masters and Johnson have estimated that 50% of married couples have major sexual problems. Other investigators have found that many patients who see a physician present sexual complaints. Often these problems are presented in an offhand way or they are minimized because of embarrassment. The physician's ability to ask the right questions and to listen in a calm and nonjudgmental way will often determine whether the patient receives help.

Cole and Cole, in their article, "Sexuality and Physical Disabilities,"* point out the significant impact that illness can have on sexual functioning. Patients often hesitate to initiate discussion of the sexual difficulties and concerns caused by illness; therefore, it is helpful if the physician can do so. Discussion with the patient and his or her spouse has a number of benefits. If the couple has a difficult time talking with each other about their sexual adjustment, a conjoint interview with the physician or another health-care professional can lead to increased communication. The spouse's understanding of the patient's sexual limitations and concerns can also be increased by a conjoint interview. This technique gives the spouse a chance to voice his or her own frustrations or concerns about the sexual problems. Finally, if genital expression of sexuality is impaired, a conjoint interview gives the couple an opportunity to discuss alternative approaches to sexual satisfaction.

Knowledge of both normal and impaired sexual functioning as well as the ability to discuss sexual topics and feelings comfortably is essential for the physician if he is to help patients deal with the impact of illness on sexual adjustment. Fortunately, most medical schools now include courses on human sexuality in their curricula, and many provide an opportunity for students to examine and reevaluate their own attitudes toward sexuality. As indicated by Cole and Cole, continuing-education programs are also available for physicians who would like to increase their skills in this area.

David Osborne, Ph.D.†
Rochester, Minnesota

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*Cole, T M. and Cole, S.S.: Sexuality and Physical Disabilities. Minnesota Med 60:7:525, 1977.

†Consultant, Section of Psychology, Mayo Clinic and Mayo Foundation.

Letters to the Editor

Thyrotoxicosis and Psychosis

Dear Editor:

We were very interested to read Drs. Pehling and Mork's report on thyrotoxicosis and psychosis*. We wish to report results of a routine endocrine screening program for thyroid and adrenal dysfunction among unmedicated psychiatric patients.

Psychological abnormalities have long been associated with thyroid gland dysfunction[1,2,3] and also can be observed in patients suffering from Cushing's Syndrome,[4,5] Addison's Disease,[6] and hypopituitarism[7]. No specific psychological profile has been correlated with any endocrine disorder, and consequently, there may be no way to distinguish psychiatric problems caused purely by emotional disturbances from those caused or aggravated by underlying endocrine disease.

Thirty-eight females and 12 males between the ages of 18 and 62 have been screened since July, 1976. These were patients admitted to the general psychiatric service at the Upstate Medical Center and who could be safely kept off medications. Patients were

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*Thyrotoxicosis as a Cause of Psychosis. Minnesota Med 60:3:169, 1977.

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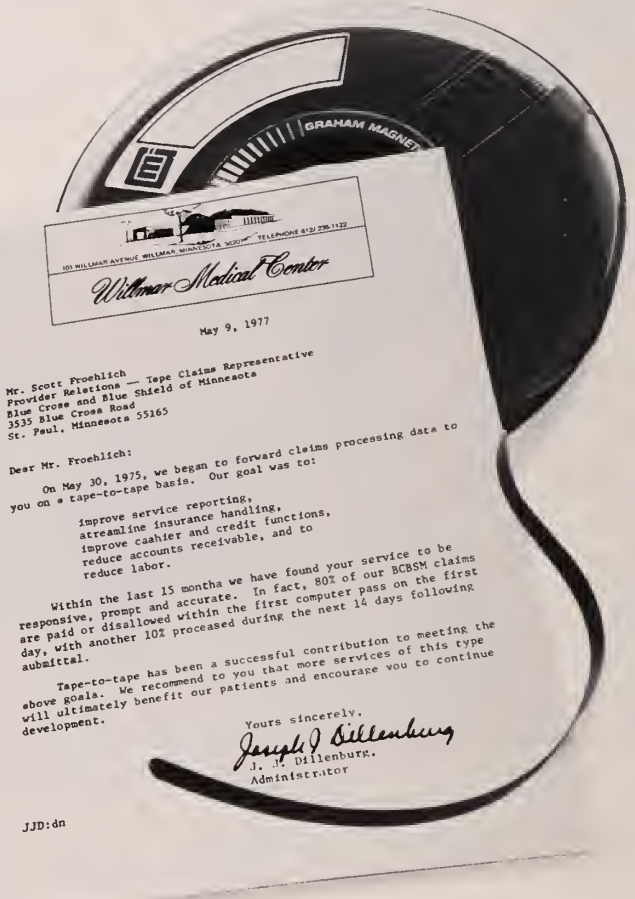
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Willmar Medical Center

May 9, 1977

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Yours sincerely,

Joseph J. Dillenburg
J. J. Dillenburg,
Administrator

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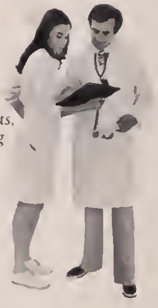
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allowed aspirin for headache and Dalmane (flurazepam) for sleep. This was necessary since various medications such as barbiturates, anti-depressants, chloral hydrate, phenothiazines and chlordiazepoxide interfere with Porter-Silber analysis of urinary 17-hydroxycorticosteroids (17-OHCS)[8]. Following a five-day adaptation period to avoid spurious results secondary to the stress of admission,[9] 24-hour urines were collected for analysis of 17-OHCS as Porter-Silber chromagons.[10] Blood was drawn for serum thyroxine (T4) by R.I.A. and free thyroxine (FT4) analysis by Bio-Science Laboratories (Van Nuys, California). Urinary collections were repeated 2 weeks later on patients with 17-OHCS values outside the normal range of our laboratory (2.0 - 6.5 mg 17-OHCS/gram creatinine per 24 hours).

Three patients, two admitted for psychosis and the other for anxiety neurosis, had serum thyroid hormone levels outside the normal range. These patients had presented with clinical symptoms of agitation, tachycardia, diffuse sweating and restlessness. All symptoms had been attributed by the staff psychiatrist as a manifestation of their psychiatric disease. Following one month of therapy with 60 mg daily of methimazole, two patients showed resolution of their psychosis and clinical symptoms. All psychological and physical symptoms dissipated concurrently with FT4 and T4 levels falling over a two-month period into the normal range. The third patient spontaneously improved over a six-week period and had no clinical evidence remaining of her previous tremors, restlessness, sweating and tachycardia. Her psychiatric profile also improved concurrently with the falling of serum FT4 and T4 values to normal levels. Spontaneous remission in thyrotoxicosis has been noted by others.[11] Elevated urinary 17-OHCS values on two patients probably resulted from increased metabolism of cortisol, and fell to normal values following resolution of their thyrotoxic features.

A fourth patient, a 21-year-old female, diagnosed at admission as suffering from depressive neurosis, presented with a sexual identity problem (lesbianism), oligomenorrhea and severe hirsutism since puberty. Laboratory findings revealed elevated 17-OHCS and 17-ketosteroids (17-KS). Therapy daily with 0.5 mg of dexamethasone at 11 P.M. resulted in a return of her periods by the tenth day of treatment, and lowering of 17-OHCS and 17-KS levels to the normal adult female range. There was significant psychological improvement in this patient's self-image as a female by the time of discharge one month later. Follow-up at three months revealed regular periods and slightly improved hirsutism.

Among 50 unmedicated psychiatric admissions, three patients (6%) had thyrotoxic symptoms and elevated FT4 levels. In both patients, psychiatric improvement occurred during remission of the thyrotoxic features. One patient presented with increased levels of 17-OHCS and 17-KS, probably of adrenal origin, that responded to dexamethasone therapy by resumption of normal periods. Further follow-up of these four patients is indicated to determine the effect of endocrine therapy in improving their long-term psychological profile. Since endocrine abnormalities occurred in 8.0% of the studied population, more routine wide-spread screening of all psychiatric admissions is needed to determine the true prevalence of thyroid and adrenal disease which may be contributing to their psychiatric illness.

See references on page 594

Andrew David Weinberg
David H. P. Streeter
Department of Medicine
S.U.N.Y. Upstate Medical Center
Syracuse, New York

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Leukemia

Dear Editors:

Dr. Clara Bloomfield bases her editorial admonition in the July issue of MINNESOTA MEDICINE* that all adults with acute nonlymphocytic leukemia be referred to major research centers for treatment on comparison of results of treatment at the St. Louis Park Medical Center and local community hospitals 1970-1976 (MINNESOTA MEDICINE,† June 1977) with those of major research centers during the past three years. She hints that practicing physicians may not be aware of significant changes occurring in the treatment of adult acute nonlymphocytic leukemia and informs us of recent government decisions to permit use of new experimental drugs only in major treatment centers.

The overall results we reported reflect several years of evolving experience in treatment of adult acute nonlymphocytic leukemia, but Dr. Bloomfield failed to note that among nine more recent patients treated with Daunomycin-Cytosine Arabinoside the overall response rate (complete remission and partial remission) was 67% and the complete remission rate 55%. Five of our last eight adult ANLL patients treated since that report have achieved complete remission (61%), one of them being a 78-year-old woman with an initial white count of over 250,000. These results compare favorably with those of major centers.

Clearly not many physicians treat acute leukemia in community hospitals, but those who do maintain awareness of changes in treatment and have been in a position to follow the best protocols and drugs available. Furthermore, many community hospitals are as well equipped to provide necessary supportive care for the management of adults with ANLL as are hospitals in major research centers and at significantly lower cost. Those patients with major complicating coagulopathies should be referred to centers with sophisticated coagulation laboratories.

Finally, in view of changing government policies regarding new drugs and in the further evolution of our care of patients with advanced malignancies including acute leukemia, the St. Louis Park Medical Center Oncology Section along with other physicians in the community will be affiliating with the Eastern Cooperative Oncology Group for ongoing study and care of patients with these malignancies.

Robert Green, M.D.
St. Louis Park Medical Clinic

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*Page 491, July issue, 1977.

†Green, Robert A.: Treatment of Acute Leukemia 1970-1976. Minnesota Med 60:5:323, 1977.

Financial Squeeze on Hospitals

Dear Editor:

I have recently noticed your editorials in the January, 1977* editions of MINNESOTA MEDICINE concerning the financial squeeze on hospitals and the implications for physicians. Canadian doctors and administrators will look upon your thoughts from a different standpoint than our colleagues south of the border and perhaps my few comments will be of interest to your readers.

I am slightly amused by the section dealing with the administrator's options, as in our situation (universal medicare) most of these options disappear very quickly. In practical terms, we are able to do something about hiring and purchasing but in the face of ever inflating expectations, even these become uncontrollable very quickly. The economy of this province is very depressed and subsequently, there is virtually no funding available for capital investment. We are a regional hospital and we are required to provide specific services. We generally operate with 100% occupancy and, therefore, there is no source of relief in increasing our occupancy. So in practical terms, we are down to cost containment, and I am glad to see that this is where you place your emphasis. In the end, it's the only thing where we doctors can make a difference.

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*Page 5

In recent months, the Canadian economy has not experienced the same resurgence being noted in the United States. We still have massive unemployment, problems in government financing and expectations which many authorities consider unreal. Specifically, our people are demanding more and more health care, our hospitals are usually full, and there still seems to be an unsatisfied demand. Yet, at the same time, we must pretend to cope with the cost of all this. Obviously, there is a dilemma and we have yet to find the answer. I am a firm believer in the benefits of a medical care plan but perhaps our Canadian experience will lead Americans to consider the financial implications before opting irrationally for a universal system.

Peter J. Roberts, M.D.
Director, Dept. of Community Medicine
St. Anthony, Newfoundland
The International Grenfell Association

References

Thyrotoxicosis and Psychosis–Weinberg and Streeter (page 589)

1. Johnson, W O: Psychoses and Hyperthyroidism. J Nerv Mental Dis. 67:558, 1928.
2. Asher, R: Myxoedematous Madness. Brit Med J 2:555, 1949.
3. Whybrow, PC, Prange, A J. and Treadway, C R: Mental Changes Accompanying Thyroid Gland Dysfunction: A Reappraisal Using Objective Psychological Measurement. Arch Gen Psych 20:48, 1961.
4. Freedman, A M, Kaplan H I, and Sadock, B J: Comprehensive Textbook of Psychiatry (Modern Synopsis). William and Wilkins Co.: New York, p. 467, 1975.
5. Michael, R P and Gibbons, J L: Interrelationships Between the Endocrine System and Neuropsychiatry. Intern Rev Neurobiol. 5:243, 1963.
6. Cleghorn, R A Adrenal Cortical Insufficiency: Psychological and Neurological Observations. Canad Med Assoc J 65:449, 1951.
7. Dissanayake, S A W and Leiberman, D M. Hypopituitarism with Paranoid Psychosis: A Description of Two Cases. J Neuro Neurosurg Psychiat 32:233, 1969
8. Alsever, R N and Gotlin, R W: Handbook of Endocrine Tests. Year Book Publications: New York, pp. 40-41, 1967.
9. Sachar, E J: Cortiosteroids in Depressive Illness. Arch Gen Psychiat 17:544, 1957.
10. Porter, C C and Silber, R H: A Quantitative Color Reaction for Cortisone and Related 17,21-hydroxy20/ketosteroids. J Biol Chem 85:201, 1950.
11. Hyman, H T. and Kessel, L. Studies of Exophthalmic Goiter and the Involuntary Nervous System. Arch Surg 8:149, 1924.

Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

The Editors

MINNESOTA MEDICINE

The Board of Editors of MINNESOTA MEDICINE invites the members of the Minnesota State Medical Association to submit examples of their art work for publication on the cover of MINNESOTA MEDICINE. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of MINNESOTA MEDICINE, 101 East 5th St., Suite 900, St. Paul, Minnesota 55101.

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Cover Editor

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*Czapek EE: *JAMA 235*:636, 1976.

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Usage in ambulatory patients. Caution patients that these products may impair mental and/or physical abilities required for performance of potentially hazardous tasks such as driving a car or operating machinery.

Interaction with other CNS depressants. Patients receiving other narcotic analgesics, general anesthetics, phenothiazines, tranquilizers, sedative-hypnotics, or other CNS depressants (including alcohol) may exhibit additive CNS depression; when used together reduce dose of one or both.

Usage in Pregnancy. Safe use is not established. Should not be used in pregnant patients unless potential benefits outweigh possible hazards.

Precautions: ***Head injury and increased intracranial pressure.*** Respiratory depressant effects of narcotics and their capacity to elevate cerebrospinal fluid pressure may be markedly exaggerated in the presence of head injury, other intracranial lesions or a pre-existing increase in intracranial pressure. Narcotics produce adverse reactions which may obscure the clinical course of patients with head injuries.

Acute abdominal condition. These products or other narcotics may obscure the diagnosis or clinical course of acute abdominal conditions.

Special risk patients. Administer with caution to certain patients such as elderly or debilitated patients and those with severe impairment of hepatic or renal function, hypothyroidism, Addison's disease, or prostatic hypertrophy or urethral stricture.

Adverse Reactions: Most frequently include lightheadedness, dizziness, sedation, nausea, and vomiting; more prominent in ambulatory than in nonambulatory patients; some may be alleviated if patient lies down; others include: euphoria, dysphoria, constipation and pruritis.

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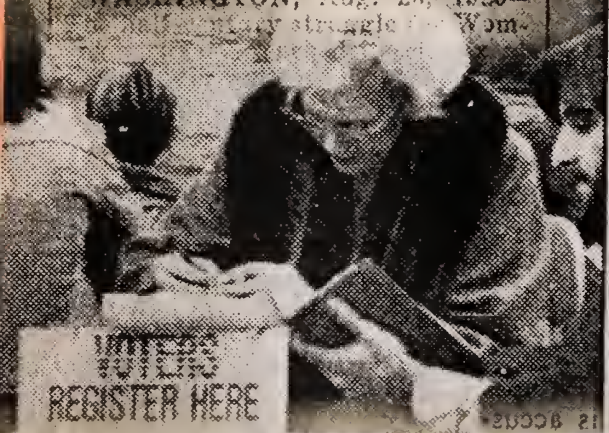

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SENATE APPROVES 18-YEAR OLD VOTE IN ALL ELECTIONS

Amendment to Constitution is Sent to House, Where Passage is Expected

WASHINGTON, March 10, 1971—The Senate approved today, 94 to 0, and sent to

TRUMAN CLOSES NITED NATIONS CONFEREN WITH PLEA TO TRANSLATE CHARTER INTO DEEDS

NEW WORLD HOPE

President Hails 'Great Instrument of Peace,' Insists It Be Used

HISTORIC LANDMARK

Meeting Gives Standing Ovation as Executive Pictures Peace Gain

"If we fail to use it," he declared to the solemn final meeting of the delegates, 'we shall betray all of those who have died in order that we might meet here in freedom and safety to create it.'

"If we seek to use it selfishly—for the advantage of any one nation or any small group of nations—we shall be equally guilty of that betrayal."

Fervent Interpolation

The President, speaking in the auditorium of the War Memorial Opera House, built in memory of sons of the Golden Gate city who gave their lives in the first World War, in which he himself served, seemed to give unconscious expression to the solemn feeling of the occasion when, at the outset of his speech, he interpolated the words, half a hope, half a prayer:

"Oh, what a great day this can be in history!"

SIGN
the Dr
Ends N

WASHINGTON, Jan. 27, 1973—"With the signing of the peace agreement in Paris today, and after receiving a report from the

PATIENT PACKAGE INSERTS: A CONCEPT WHOSE TIME HAS COME?

The consumer's right to know is an irreversible and desirable trend of the Seventies. It extends, and properly, to a patient's right to know more about his or her prescription medications. One way, gaining favor, is through patient package inserts. Wisely-prepared and properly distributed when medically indicated, they could markedly improve patient knowledge and drug therapy—laudable goals by anyone's standards.

The PMA endorses these goals and will work with government, the health professions and consumers to achieve them.

The Advantages

The concept holds promise of benefits: better patient understanding of the product prescribed, better adherence to the treatment plan, and more awareness of possible side reactions.

Every doctor has had patients who fail to finish antibiotic regimens because they feel better. Some patients assume that if one tranquilizer or analgesic is good, two may be twice as good. Still others fail to report dizziness while on antihypertensive therapy —and so on.

Problems like these might arise less often if the patient received written information in addition to verbal instructions. Some studies suggest that patients are more receptive to such materials, and they more often understand the verbal instructions and follow them, when inserts are used.

The Disadvantages

There are also some potential problems. Obviously, the inserts must be clearly phrased, without extraneous or complex detail. How much information is enough? How can it be kept current? Should all patients receive the same information? Should inserts be included with all drugs? Should only potential problems be listed or are patients better off with a "fair balance" presentation that describes usefulness as well as drawbacks?

These and similar questions require answers, since model inserts have yet to be properly developed and tested. Despite the need for these studies, the FDA is proceeding prematurely with inserts on selected products. We think the Congress is the only place where the matter can be given the proper legal status and direction, particularly since it represents a conceptual change in the legal, medical and social framework of the nation's prescription drug information system.

The Solution

The PMA believes that carefully-devised pilot studies of various kinds of inserts are needed. They should be developed and implemented with full participation by doctors, pharmacists, consumers, communications experts and the drug industry. Such studies will provide reliable pathways to follow, so that inserts will be useful aids to medical practice.

And particularly we think that you should be closely involved in this debate and in these studies and decisions. Otherwise, people with less experience and qualifications may control the purposes, content and use of a tool with considerable promise for improved patient care. It could make a difference in your practice tomorrow, and more importantly, in the health of your patients.

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Thrust and Counter Thrust

*Remarks** by

Secretary of Health, Education, and Welfare

JOSEPH A. CALIFANO, JR.

I think it's a good thing for you and me to meet face to face; to exchange views fully and freely in a spirit of mutual respect and candor.

As professionals, we must remember that doctors and lawyers are never as good as our patients and clients say we are when their illness is cured or their case is won — and never as bad as they say we are when they get the bill.

In the short time that I've been in office, I have enjoyed the most cordial relationships with the officers and executives of the American Medical Association. They have kept me informed of your views — especially when they diverged from mine!

And I have tried to be open and candid with them — including acknowledgment of mistakes when we think we've made them.

This meeting is part of the essential, continuing communication that must exist between organizations like the AMA and a Secretary of Health, Education, and Welfare. So I'm grateful to you for your hospitality. And I know that the overriding objective we all share is better health for all Americans.

It is against the background of this shared objective that I accepted your invitation to address the opening session of the American Medical Association's National Convention.

I thought it important for you to understand first hand how the new Administration views the health care industry and how we view the doctors who shape so much of that industry.

Americans would like to cling to some hallowed images of medical care in our nation: images that reach back to the placid past of our grandparents.

One cherished image is that of the stern but wise family doctor of Victorian years, jouncing in his buggy from house to house, dispensing pithy wisdom along with the castor oil.

A second image is of more recent vintage: it is the flickering image of the television doctor: first, young Dr. Kildare, then Dr. Ben Casey, and finally, the reassuring, confidently omniscient Marcus Welby, M.D. Unlike you, Dr. Welby has only one patient at any given time. And there's another difference: all of his patients get well within the hour.

But the reality of modern medical practice today, as you well know, is much more complicated than Norman Rockwell covers for The Saturday Evening Post or television films.

It is our perception of that reality I would like to discuss today: the problems of medical practice and public policy that it poses for you and for me; and some urgent action that all of us — the administration and the Congress, physicians and citizens — must take as we begin to deal with those problems.

For we have set ourselves an ambitious goal in America: a high standard of health care for everyone — at manageable cost.

The extraordinary talent of so many doctors has encouraged us to set our sights high. The genius of a few has provided discoveries that have given millions of our citizens superb quality care. The dedication of many has saved lives and eased pain and misery for generations of Americans.

We know that quality care is available for many Americans. We want to make that quality care available for all Americans. We seek to do it at reasonable cost. The achievement of these two goals at the same time — quality care for all, at reasonable cost — is what we are about.

The quality care objective has long characterized American medicine and physicians, but reasonable cost has not been the strong suit of either American medicine or most of its physicians. We see that not as the fault of affluent doctors — but as the most serious shortcoming of the health care system.

If we are to meet these dual ambitious goals, or even approach them, we must first see the nation's health care system clearly for what it is.

To do that, we must pull the camera back; back from the past; back from fiction, with its narrow, close-up view of Dr. Welby. When we do that there comes into view a vast, sprawling, complex, highly expensive and virtually non-competitive industry — one of the nation's largest though least understood industries, a unique system of economic relationships that are commanding, and controlling, an ever larger share of our nation's resources.

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*Before the American Medical Association, Fairmont Hotel, San Francisco, June 19, 1977. By permission.

We perceive health care in America today as big business.

To be sure, health is not just another industry; the enduring strength and high quality of the doctor-patient relationship is a vital element in the medicine of the 1970's, just as it was a generation ago — and generations before that.

But the term industry is still an apt one — and it provides a critical perspective on the health care system for public policy makers.

With expenditures of $139 billion in 1976, the health care industry is the third largest in the United States. Only the construction industry and agriculture are larger.

- In 1975, 4.8 million people worked in the health industry. That was 5.1 percent of the national workforce — slightly more than one American worker in 20.
- In the same year, 375,000 physicians were in practice in America: one for every 570 citizens.
- Health care spending was 5.9 percent of the Gross National Product in 1965. It was 8.3 percent in 1975. And, at present inflation rates, it could reach 10 percent of GNP by 1980. In that year, spending on health care will, without some kind of restraint, have ballooned to $230 billion, $1,000 for each man, woman and child in America.

The giants of corporate America have moved in to obtain their share of the health industry — major companies like IBM and Bausch & Lomb. Many of the major pharmaceutical companies are in the Fortune 500. The profits of these drug companies are far above the average for large corporations in America.

We perceive health care as an inordinately complex and fragmented industry. It contains over 7,000 hospitals with a total capacity of 1.5 million beds; 16,000 skilled nursing homes, with a capacity of 1.2 million beds; thousands of laboratories and hundreds of suppliers of drugs, expensive medical equipment and other medical products.

Decisions in this industry are made — by a host of private and public institutions — without adequate planning at the state and local level.

We perceive health care as a very costly industry. The median income of the average American family was $13,700 in 1975. In that same year, the average family expenditure for health care was nearly $1,600, more than 10% of the median income.

An average hospital stay cost less than $350 in 1965. It now costs over $1,300. Private health insurance premiums have jumped 20-30 percent in just the last year alone.

And the American people paid doctors a total of $26.3 billion in 1976.

We perceive the health care industry as virtually non-competitive. The features of the competitive marketplace that have served our people so well in other industries — to promote efficient allocation and utilization of resources — are just about non-existent in the health care industry.

- The patient — the consumer — may select his family doctor — but he does not select his specialist, his hospital, the services he is told he needs, the often expensive medical tests to which he is subjected. The physician is the central decision-maker for more than 70 percent of health care services.
- Increasingly, the patient — the consumer — does not pay directly for the service he (or she) receives. Ninety percent of the hospital bills are paid by third parties — private insurance companies, Medicare, Medicaid.
- These reimbursement mechanisms usually operate on a cost-plus or fixed-fee-for-service basis, the most expensive and least efficient ways to function.
- Most public and private benefit packages are heavily biased toward expensive in-patient care.
- The unavailability of price and quality information keep the consumer of health care services dependent on the decisions of the health care provider, who plays a dominant role in determining demand for health services and whose financial well-being is determined by the price charged.
- The ability to restrict access to competitors — hospital credential committees that can deny or delay privileges to Health Maintenance Organizations, for example — provide special levers of market control.

These are some of the dominant economic features of the health care industry — features which provide many powerful incentives to spend more, and few, if any, incentives to spend more efficiently.

We must face a basic fact: there is virtually no competition among doctors or among hospitals. And, just as important, there is precious little competition among pharmaceutical companies or among laboratories. For pharmaceutical and medical device and equipment research has become big business, with patent monopoly pots of gold at the end of the research rainbow.

These economic features pose severe problems in allocating and utilizing health care resources in the most effective way possible — problems that, although grounded in the economics of health care, relate ultimately to the broad national goal of providing, with limited resources, quality health care to all Americans at reasonable cost.

We do not perceive the health care industry as a world of good people and bad people. Doctors are not bad and para-professionals good. Hospitals do not wear black hats while government policy makers wear white ones. That is not the point.

The point is that doctors, hospitals, pharmaceutical companies, nursing home operators — all the inhabitants of this non-competitive, free spending, third party-payor world — act exactly as the incentives motivate them to act: conscious of quality, insensitive to cost.

The result, inevitably, is a set of economically classic structural problems.

First: Our health resources, abundant as they are, are not well-distributed, either economically or equitably.

In the past ten years, we have made considerable strides toward opening access to health care for many people. But major problems remain:

—We have not done a very good job over the past ten years of helping rural Americans get ambulatory care. The typical rural citizen is twice as likely never to have had a physical examination, as the typical citizen of a large metropolitan area. Many rural women fail to receive basic early cancer detection examinations.

—In our inner cities, minority citizens still lag far behind others in their access to physician care. Polio immunization rates for black children under the age of four are one-third lower than the rates for white children.

—Here in the State of California, of 1.2 million eligible poor children, only 20,000, — less than two percent — have been reached by a joint State-Federal early screening diagnostic and treatment program. Only 12,000 of these children — 1 percent — have been treated. This Administration has proposed new legislation — the Child Health Assessment Program — to correct this intolerable situation on a nationwide basis.

Yet, while some are starving for health care, obesity is commonplace for others. Nationwide we have an excess of some 100,000 hospital beds. There are enough cat scanners in Southern California for the entire western United States.

We have made progress in absolute numbers in ending the doctor shortage of 10 years ago; but doctors are unevenly distributed, geographically and by specialty. Manhattan has 800 doctors per 100,000 people; Mississippi, fewer than 80. In some disciplines, we have too many specialists, while the desperate need for primary care physicians in many rural areas persists.

And so we face a major national challenge: to redirect the flow of new health resources into underserved areas and to underserved groups so that ultimately all Americans will have fair access to quality health care. And we must ask: Can we do this in an industry with virtually no competition? Indeed in an industry where the economic incentives move in the opposite direction?

Second, not only are our health care resources poorly distributed – they are often not organized as efficiently as they might be.

As physicians have moved to more lucrative practices in the suburbs, for example, the burden of providing primary medical care in our inner cities has fallen increasingly on the outpatient departments of large metropolitan hospitals. Yet the cost of this kind of care is high: For many patients, two or three times higher than the same services offered in other settings, such as Health Maintenance Organizations and community health centers.

We have not made much progress in using non-physician health professionals to take some burdens off the physician — even though we know that nurses, physician assistants and other primary health practitioners can less expensively assume many tasks traditionally performed by physicians, without lowering the quality of care. Liscensure laws are essential to preserve and maintain professional standards, but they should not be permitted to inhibit the development of new patterns of care.

Third, with little incentive to be cost effective in the use of skills and resources, it is no wonder that our present health-care system emphasizes acute care over prevention. Because of this, we are needlessly risking illness and sometimes even lives and recklessly consuming resources that could be used to meet other urgent needs.

Today the health-care challenge is dramatically different from what it was ten or twenty years ago. Today the leading killers are not communicable diseases, but accidents, heart disease, cancer, cirrhosis of the liver — which are often caused by people's lifestyles or by hostile influences in the environment.

Yet, our health-care system is not really geared to the field of prevention aimed at these killers.

We could literally save thousands of lives that are now being stunted or lost — if we could reduce the ravages of:

—Cigarette smoking, which kills through cancer, heart attack, and emphesema.

—Alcoholism, and its toll in mortality, morbidity and the destruction of family life.

—Obesity, with its sinister companions, diabetes and hypertension; and

—Accidents, which kill and maim in the office, at home, and on the highway.

In the case of each of these killers, we already have enough knowledge to make major lifesaving gains. What we lack is sufficient will and ingenuity in educating our fellow citizens about how to live more safely and sensibly. And we sorely lack a health-care system with economic incentives as strong to prevent as they now are to cure, one which makes prevention as profitable for providers as treatment now is.

Fourth, our system of health insurance in America is an expensive and inequitable crazy quilt.

Some eighteen million Americans — most of them unemployed or employed in small non-manufacturing businesses — have no health insurance at all.

Another nineteen million Americans — most of them with incomes between $5,000 and $10,000 — have no group insurance, only skimpy individual coverage that is at best inadequate.

Nearly half the population under age 65 does not have insurance that is sufficient to cover major medical expenses. National Health Insurance to protect all Americans from the crushing burden of medical expenses is essential. And I am pleased to note that you agree on the need and have been developing your own plan.

Which brings me to the overarching problem of the health care industry in America: The problem of runaway costs. In part because of these other problems I have sketched, the cost of medical care is soaring today.

Not only is health care spending devouring an ever larger share of our Gross National Product, but, under current projections:

- Total health expenditures will double by 1980;
- Hospital costs paid for by Medicare and Medicaid will double even sooner;
- If unchecked, total hospital costs could reach $220 billion by 1985.
- Health care is rising at a rate of two and one half times the rise in the cost of living.

This rapid inflation imperils the ability of uninsured people to get health care at all. It gobbles tax dollars at such a rate that they are not available for other public priorities. The federal government spends 12 cents of every taxpayer dollar on health care. The average American worker works one month each year to pay health care costs.

Clearly, the health care industry, as presently structured, has become a problem for all of us — patients, physicians, providers of care, and public officials. Certainly we can understand why the American consumers and taxpayers — and more and more top executives of large corporations — are demanding that something be done.

Thus far, the Administration has pressed forward on the cost front, as you know. The President has sent to the Congress legislation that would control the precipitous rise in hospital costs — the most inflationary sector in the health industry.

But we recognize that the proposal we have put forward — a limit on increases in total hospital revenues — is merely a stop-gap solution that is a necessary transition to more profound structural, long-term reform.

For the long term we must begin to organize health resources more effectively, distribute health care benefits more equitably, emphasize prevention and primary care, and establish a fair and effective system of national health insurance.

Why have I spoken to you at such length about all these problems: Because you, more than any other members in the health care system, are its leaders and decision makers.

In past generations, your profession has led this nation to some striking achievements: a longer lifespan for our citizens; lower infant mortality, the near-elimination of many infectious diseases, a rigorous system of medical education.

In the future, we must not only protect those life-saving gains; we must face another, wholly new set of challenges:

—The challenge of dramatically improving the cost-efficiency of our health care system;
—The challenge of re-directing our health efforts towards prevention as well as acute care.

Those are not challenges laid down by a government bent on ever-increasing regulation. They are demands that come from the American people and public officials, and increasingly from many of your own member physicians, who are urgently concerned about both the medical and economic health of our people.

So the government — representing the people and the consumers — must play an increasing role in health care. We will fulfill our responsibility best with your help and cooperation: but we must fulfill our responsibility nonetheless.

There are hard choices ahead; there are difficult decisions. We ask you to help us to act thoughtfully; to join with us in seeking solutions to these problems.

I believe that the American people would prefer, — as I, and presumably you, would prefer — that the leadership in solving these problems come from within the health care system — from you — rather than from outside of it.

Some physicians are, in fact, providing such leadership.

- A large group of physicians are now partners with us in the management and operation of the PSRO program. These physicians are establishing standards, reviewing quality and sharply examining the appropriateness of care given by other physicians. We intend to expand and strengthen the PSRO program.

- Recently, a leading obstetrician expressed serious concern about rising OB costs and spoke out for dramatic consolidation of facilities to produce quality obstetrical care.
- Medical schools and a growing number of physicians are responding to our need for primary care.
- Some surgical specialists are taking the lead in a critical self-examination of excess surgery.
- More and more physicians are joining and starting HMOs.

These are progressive steps. We hope many more hysicians will begin taking them.

The story is told that Winston Churchill once paid a isit to his doctor because he was feeling terrible. His octor, after carefully examining him, said, "Mr. rime Minister, if you want to feel better, I suggest you cut back drastically on your consumption of brandy and cigars."

Whereupon Churchill fixed a withering stare on his doctor and replied: "My good man, I have no intention of doing either. That is why I have come to you."

And that, in fact, is what all of us have been doing for too long in this field of health care: using our affluence to cure problems, rather than our ingenuity and self-discipline to prevent them. We have not been willing to confront the hard fact that resources are limited and that we must find new methods to provide quality health care to all Americans at reasonable cost.

Now, the cost of our indulgence — like the cost of Mr. Churchill's indulgence — is catching up with us. We can no longer buy our way out of our difficulties. We must *think* our way out.

James H. Sammons, M.D.[*]
Report to the House of Delegates

In making this third report of the Executive Vice President to the House of Delegates, I find it a welcome change not to have to spend much time on the financial condition of the American Medical Association.

Our reserves, especially our liquid reserves, are at appropriate levels and approaching the targets this House set when dues were increased at the 1975 annual meeting. Our operating statement is equally healthy, partly because membership is at a level above our projections, partly because advertising revenues are stronger than we expected, and partly because we were a bit too optimistic about the speed with which we could fully implement new, authorized programs.

While the financial figures look good, I want to caution you that there remain unresolved two potentially substantial liabilities, in respect to the U.S. Internal Revenue Service and the U.S. Postal Service. In looking at long range commitments, I would remind you also that we are pledged to test the constitutionality of the Health Planning Act and to defend our ethical position against the complaint of the Federal Trade Commission. Just what those commitments will entail in terms of outside legal fees is hard to determine.

In view of all those indeterminable considerations, we must continue the 1975 policy adopted by the House of Delegates to maintain strong financial reserves. To do otherwise would be foolhardy.

Reflecting further on the important events of the past six months, I think it appropriate to report on the beginnings of our relationships with members of the new administration. We have had meetings with HEW Secretary Califano and other key people in the executive branch, all of them generally constructive.

Yet we have come away from them with a widely shared feeling that the administration right now appears long on shadow but short on substance. I am personally uneasy that there is too much gesture, too much vagueness in Washington now — some hard thinking possibly, but soft programming, a lot of head but little beer.

As an example of the sort of thing I refer to, I would cite the handling of the National Health Insurance Advisory Committee. This Committee was formed with representatives of all points of view, including ours, presumably to have input into HEW's proposal.

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[*] Executive Vice President, American Medical Association, San Francisco, California, June 19, 1977. By permission.

But now it is clear that the Committee is neither to make a report nor to have any real input into the development of the administration's thinking. Why bring in important people, and then tell them, at the first meeting, that their deliberations are not really going to count? It is an empty gesture indeed. And we are not alone in recognizing it.

Certainly we want to keep the lines of communication open, and we will do so. But as we are all aware, meetings for the sake of meetings are the emptiest gestures of all.

I have expressed our fears that the new organizational structure within HEW will weaken the role of the Assistant Secretary for Health, thereby diminishing the purely medical side of HEW's decision-making process. That is not in the best interests of the health of this country, nor is that in the interests of physicians. We are on record as seeking a free-standing federal Department of Health, taking the H out of HEW and making it independent under a Secretary of Cabinet rank. Short of that, we would urge a Department of Defense structure for HEW, with a Secretary of Health on the same level as the Secretary of the Army, Navy, and Air Force. The health of the American people is important enough to justify that sort of emphasis.

It is clear to me, though, that health is not the top priority in the new administration. Cost-control is. Witness the creation of the powerful new Health Care Financing Administration. Witness the unworkable legislation proposed to cap hospital revenues.

I would add parenthetically that we are truly dwellers in Cloudland if we do not anticipate some similar future move to cap physician fees.

As someone just back from a good look at the British National Health Service, let me tell you what happens when cost becomes the overriding factor in medical decisions. First you get rationing of care to patients. Next you get second-rate medical equipment. Then there is a predictable pinch on physician training. And finally, somewhere down the road, you wake up one day to find you have a second-rate medical care system instead of a first rate system.

I do not think that HEW's efforts at cost containment will be permitted to go that far. But the temptation is there. So is the political appeal to the pocketbook.

Frankly, I think HEW tends to listen too much to computers rather than to people. There is a unilateral quality to HEW decision-making that I find disturbing. I really have to ask, for example, what segments of the American people benefit from that incredibly botched list of Medicare recipients last March. Or who is going to benefit from the three-quarters of a million dollars now pledged to develop the new, improved list of physicians serving elderly patients. I certainly should think that HEW could come up with a more people-oriented way of spending $750,000 from our national health resources.

Just what sort of national health insurance proposal is contemplated by the Carter administration is hard to say. But no matter what it is, it will likely work at cross-purposes with those in HEW who consider curbing the rise in medical care expenditures the main item of priority. In health policy as well as others, there are strongly competing dynamics in Washington, and their resolution is far from clear.

Because the plans of the Carter administration for major health legislation are still only general, I do not want to make any specific forecasts. However, there is no question but that important challenges lie ahead for our profession. It therefore seems appropriate to give you my evaluation of the AMA's organization position as we face these challenges.

I would remind you, first of all, that the major issues before us are public issues. While they will not be resolved by plebiscite, they will certainly be resolved within the participatory climate of these times. Public opinion, or more precisely what legislators think is public opinion, therefore becomes a matter of urgent importance to us.

When you review the independently gathered public opinion data that is available to us through the Gallup organization and the Spencer/Roberts study, done in conjunction with Market Opinion Research, a picture of surprising AMA strength emerges. The credibility of the AMA, relative to other institutions in our society, rings out loud and clear. In terms of credibility of communications — which I think is a fair index — there is not a business, trade, professional, labor or governmental group that outranks us. Public confidence in the AMA is high. 71% of the public say it has either a "great deal" or a "fair amount" of confidence in the AMA. That is an impressive score in these times of general distrust of establishment organizations. As medicine goes into its challenges, we open with a hand that holds encouragingly high cards.

Physicians themselves still rank first in public ratings of various professions for honesty and ethics, slightly ahead of engineers and college teachers, considerably ahead of journalists, lawyers and legislators. I cannot help but be concerned, however, that high as physicians stand, relative to others, 44% of the public rates our honesty and ethics as average, low or very low. Our marks are poorest among non-whites and families where income is less than $3000 per year. And that is disturbing.

Generally speaking, though, the public expresses satisfaction with the care it receives. You have seen various polls reporting consistently that 80% or 85% of the people are either satisfied or well satisfied with their care. Our recent Spencer/Roberts-Market Opinion Research report, which asked consumers about their last medical experience, found that 56% reported a "good" experience, only 18% a "bad" experience. This same study identified cost as the overwhelming concern to the public — and to physicians too. Hospital costs received the principal focus, yet consumers feel that physicians represent the single largest controlling factor in hospital costs. Availability is the second major public concern. But for every person who identifies that as a key issue, nearly three others list cost. I am going to come back to the subject of cost. But I want to say here that each member of the medical profession has got to acquaint himself better with the patient cost of every procedure he orders and to think twice about those of marginal cost/benefit value. By the same token, the public must be aware of what their behavior adds to cost because of nuisance suits or the threat of malpractice.

What I find particularly interesting in our public opinion surveys is the method by which the public forms its impressions of medicine. The main source of information is not the one we worry about most — newspapers, magazines or TV; it is word of mouth. There are now 2.9 million visits per day between patients and physicians, and the public attitude is formed overwhelmingly by that experience, not by what is said or is not said by the media. It is the way in which we as individual physicians deal with people as individual patients that counts. It is not what the media says that forms public opinion, but what we do.

Public perception of medicine is basically the vast sum of millions of small daily reactions by patients to the way they are dealt with, talked to and treated, medically and personally. *That* is how the physician image is formed.

The other important element in the public perception of us relates to that part of the AMA's activities that have public visibility. Much of what the AMA does, especially in terms of continuing education, informational services, and the monitoring of standards, is only vaguely visible to the public. What the public does see of the AMA as an organization falls into two categories: what the AMA does as perceived as being in the physician's interest and what the AMA does as perceived as being in the public's interest. It is my impression that an important trade-off exists here. We are a professional organization, representing physicians, and part of our energies are directed to the legitimate interests of the profession. The public is not surprised by that, nor is the public offended. But the public will consider those pursuits justified *only* if it believes that we, as an association, are simultaneously and energetically living up to our public responsibilities as well.

On the strength of this purely personal assumption of a *quid pro quo,* it is reassuring to be able to cite a number of programs addressed to our public obligations. Possibly the most visible recently is our action on TV violence, a subject on which there is a more detailed report to you from the Board of Trustees. I would only add that this kind of alert to a possible medical harm is only what is expected of us. We have worked closely with the PTA, the National Citizens Committee on Broadcasting, Action on Children's TV and other groups. We have also had constructive discussions with important advertisers, notably the General Foods Corporation. Sears, Roebuck, Greyhound, Eastman Kodak, Pillsbury, General Motors, and Schlitz are just a few companies among many that I might list who have expressed recent concern with this issue. A reduced amount of violent programming seems to be in the cards for next fall's network schedules.

And I would add that it greatly becomes the networks to assume a posture of shrinking violence.

I cannot claim that the apparent improvement is attributable to us alone, or any other one group, for that matter. But this year the on-going outcry against violent programming has had a heavier impact than ever before, because this year the weight of medical opinion was added to it.

The AMA program on the state of medical care in jails — a scandal in many places — represents another instance of meeting our responsibilities as the public perceives them.

Although it is still a long way from a final report, the AMA Commission on Cost of Medical Care represents another case of responsive action. In terms of meeting our public responsibilities on this important public concern we have taken a first step through the establishment of the Commission on Costs. But to meet those responsibilities fully, we must be ready to hear some things maybe all of us will not want to hear when the final report is made. If the recommendations are hard and disturbing to us — or to our patients — let's not shy away from them. This House of Delegates will probably have to make some very tough decisions arising from the Commission's findings, and we must not shy away from them either.

More than anything else, the public expects the AMA to police its ranks. That is something I think the public expects of all professional and trade associations. And I think it is something the public has a right to expect. In recent months in particular the AMA has demonstrated a more vigorous, a more effective, and a more visible initiative. In respect to the impaired physician — the physician with emotional problems, drinking problems or narcotic problems — 30 states have now enacted legislation backed by state medical societies and based on model legislation developed originally by the AMA and approved in this House. Possibly more important may be the action of at least 25 state societies in initiating programs of their own to deal with the small fraction of impaired members of our profession.

We have also suggested to the state societies model legislation intended to broaden the scope of state medical licensing boards. This legislation provides for better reporting, for more accessibility to information and for a wider range of options for disciplinary actions. By giving the licensing boards something more than the Draconian choice between revoking or not revoking a license, the AMA believes that more appropriate, and more effective, and more frequently imposed discipline will result. Six states have adopted legislation along these lines. Some thirty already had similar statutes in place.

We are seeing a great change in medical discipline. In a survey that includes figures from 47 states, the AMA has found that in contrast to 1300 in 1971 nearly 4200 disciplinary cases were initiated in 1976. Medical discipline should be more of an educative than a punitive process. But the threefold increase in disciplinary actions should be noted. And the initiative shown by organized medicine in helping the licensing boards move in that direction should be noted as well.

Yet I must add that we still have a way to go. Great progress has been made in many states. But in others the old problems still exist: underfinanced licensing boards, lack of staff, poor quality of staff, bad liaison with the profession itself and that traditional bane, politics. When any board is constituted by political appointment, political pressure — or the threat of political pressure — can be applied. And that should simply cease to be.

It is unfortunate that most of the public believes that the profession itself does the licensing and therefore the delicensing, that the state medical society or the AMA holds the real disciplinary powers. In the public mind we are charged with the responsibility for disciplining doctors, but we both know that we lack the accompanying authority. The best way out of that squeeze is to do what we have been doing — exerting more pressure on the licensing boards to act as we might act if we had their powers. Where appropriate, I urge state societies to continue the effort for wider adoption of the AMA's stronger licensing bills.

While I see us meeting our public responsibilities in a more forceful way, I wish I could see more movement in terms of professional unity. That is not to say we are losing ground. We are not. But progress toward a unified profession should be dynamic rather than static. On broad legislative issues our effectiveness is in direct ratio to the unanimity we display. The achievements at the state level that I have just referred to, for example, came about where the profession was united in its position. Our recent success in modifying H.R. 3816 exemplifies what a unified effort can do. Thanks to efforts by many medical organizations the provisions of this bill, granting ruinously arbitrary powers to the FTC over non-profit organizations, was dropped in Congressional committee hearings. That was an important legislative victory, not only for us, but also for organizations like the Boy Scouts, the Heart Association, the NAACP and the American Civil Liberties Union.

Probably the single most effective step we can take toward greater unity is before you—in the form of the Council on Long Range Planning's report on specialty society representation in the House of Delegates.

Much of the disunity in medicine coincides with the post-World War II trend toward greater specialization, in itself a result of explosive growth in medical knowledge. As physicians have become more specialized during this period, loyalties have tended to diffuse. In a purely scientific sense this may have had a strengthening effect. But in other respects, particularly in regard to the broader issues that should concern the physician universe, the effect has been to disperse our power.

I think it is time to seek an adjustment in our system of representation, a time to expand our House of Delegates so that the specialty society structure that exists may be more realistically recognized and its views more properly incorporated. Medicine is pluralistic, a condition which has been acting strongly as centrifugal force. But, through the suggestion before you, that same energy can be converted into an equally strong centripetal force. It is critical that we merge our forces on the broad issues. This House of Medicine must not be a house divided.

Finally, I want to remind physicians again of the importance of wider individual membership and personal involvement at all levels — county, state, specialty society *and* national. Think how much stronger we could be if only each current member could bring into the federation next year just one colleague who does not now belong. If any state wants to launch a program like that we'll help set up the names for a one-on-one membership drive. Constituting only 17 one hundredths of one per cent of the U.S. population, we need every bit of clout we can develop in terms of numbers.

We are respected as a profession. And our national organization — the AMA — is respected. It scarcely needs saying that we — and by that I mean every physician in this country — face tremendous challenges. And we can only face them successfully if we face them together. All of us. Not half of us. Or two-thirds of us. Or some other fraction.

I am sure that during at least one post-mortem over a lost political fight you have said, as I have said many, many times, "Why couldn't we have stopped the in-fighting among ourselves? Why didn't we close ranks, forget our differences, as the opposition did? And for God's sake why didn't we get the voters out?"

Sound familiar? I'm sure it does.

But I'm not talking now about Republicans versus Democrats. I'm talking about the future of your profession and mine. And what is ultimately best for our patients.

The plain and simple truth of the matter is that we cannot afford to go on as we sometimes do, jealous over fiefdoms, squabbling among ourselves, so concerned with skirmishes that we lose track of decisive objectives. Do we want to go the way of our colleagues in England? They are a perfect example of what disunity can produce.

If we cannot hang together better than we've been doing, we don't deserve to win the battles we have ahead of us.

In the AMA, the medical profession has a workable mechanism for airing viewpoints and democratically arriving at consensus. Your AMA is now a strong organization financially. It knows the ropes in Washington. It stands high in public credibility.

If it is to accomplish objectives for the profession, then the profession must understand this:

Physicians are individualistic men and women — by training, by inclination and by experience. And individualism is a fine thing.

But carried to an extreme, individualism can badly weaken the unified effort we must be making. At one point in history there was a European parliament so constituted that each member had veto power.

You can imagine how much was accomplished.

Organized medicine just cannot accommodate that kind of divisive luxury and still hope to repel the deadening weight of the governmental bureaucracy. It is a cancerous, relentless, mindless blob of a force that oozes through the cracks and seeps under the doors, and as soon as you stop it in one direction it creeps in on you from another.

Let's keep our individualistic ways and attitudes. But let's also show some restraint. For if we don't, then a strong, united profession is impossible. And without that, there isn't going to be much individualism left for any of us.

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Indications:

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Alpha-hemolytic streptococci (viridans group)—Short-term prophylaxis of bacterial endocarditis prior to dental or other operative procedures in patients with a history of rheumatic fever or congenital heart disease who are hypersensitive to penicillin.

S. aureus—Acute infections of skin and soft tissue of mild to moderate severity. Resistant organisms may emerge during treatment.

S. pneumoniae (D. pneumoniae)—Upper and lower respiratory tract infections of mild to moderate degree.

M. pneumoniae — For respiratory infections due to this organism.

Hemophilus influenzae: For upper respiratory tract infections of mild to moderate severity when used concomitantly with adequate doses of sulfonamides. Not all strains of this organism are susceptible at the erythromycin concentrations ordinarily achieved (see appropriate sulfonamide labeling for prescribing information).

Treponema pallidum—As an alternate treatment in patients allergic to penicillin.

C. diphtheriae and C. minutissimum—As an adjunct to antitoxin. In the treatment of erythrasma.

Entamoeba histolytica—In the treatment of intestinal amebiasis.

L. monocytogenes—Infections due to this organism.

Establish susceptibility of pathogens to erythromycin, particularly when *S. aureus* is isolated.

Contraindications:
Known hypersensitivity to erythromycin.

Warnings:
Safety for use in pregnancy has not been established.

Precautions:
Exercise caution in administering to patients with impaired hepatic function. During prolonged or repeated therapy, there is a possibility of overgrowth of nonsusceptible bacteria or fungi. Surgical procedures should be performed when indicated.

Adverse Reactions:
Dose-related abdominal cramping and discomfort. Nausea, vomiting, and diarrhea infrequently occur. Mild allergic reactions such as urticaria and other skin rashes may occur. Serious allergic reactions, including anaphylaxis, have been reported.

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Each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine HCl, and 2 mg phenobarbital; the alcohol content is 15%.

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Tedral Elixir: each 5 ml teaspoonful contains 32.5 mg theophylline, 6 mg ephedrine hydrochloride, and 2 mg phenobarbital; the alcohol content is 15%.

Indications. Tedral, Tedral SA, and Tedral Elixir are indicated for the symptomatic relief of bronchial asthma, asthmatic bronchitis, and other bronchospastic disorders. They may also be used prophylactically to abort or minimize asthmatic attacks and are of value in managing occasional, seasonal or perennial asthma.

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Tedral Elixir is convenient for persons who may have difficulty in swallowing tablets.

These Tedral formulations are adjuncts in the total management of the asthmatic patient. Acute or severe asthmatic attacks may necessitate supplemental therapy with other drugs by inhalation or other parenteral routes.

Contraindications. Sensitivity to any of the ingredients; porphyria.

Warnings. Drowsiness may occur. PHENOBARBITAL MAY BE HABIT-FORMING.

Precautions. Use with caution in the presence of cardiovascular disease, severe hypertension, hyperthyroidism, prostatic hypertrophy, or glaucoma.

Adverse Reactions. Mild epigastric distress, palpitation, tremulousness, insomnia, difficulty of micturition, and CNS stimulation have been reported.

Average Dosage. *Prophylactic or Therapeutic.*

Tedral: *Adults*—One or two tablets every 4 hours. *Children*—(Over 60 lb) one-half the adult dose.

Tedral SA: *Adults*—One tablet on arising and one tablet 12 hours later. Tablets should not be chewed. *Children*—Not established for children under 12.

Tedral Elixir: Note: One teaspoonful is equivalent to *one-quarter* Tedral tablet. *Children*—One teaspoonful per 30 lb body weight, every 4-6 hours, unless prescribed otherwise by physician. Should be given to children under 2 years of age only with extreme caution. *Adults*—One to two tablespoonfuls every four hours.

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PHYSICIAN ASSISTANT—BA Degree plus completion of Physician Assistant training. AMA Accreditation Certification eligibility October 1977. Resume on request. Patricia J. Davis, 16422 Devon Drive, Minnetonka, MN 55343. Tel. 612-938-2384.

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INTERNIST, PEDIATRICIAN (husband, wife) available 7/78 (latter flexible, part-full time). Excellent training. Larsen, 579 Jackson Drive, Palo Alto, California 94303. 415-326-4045.

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References:

1 Dornfeld L, Kane R Metolazone in essential hypertension The long-term clinical efficacy of a new diuretic *Curr Ther Res* **18**: 527-533, 1975

2 Data on file, Medical Department, Pennwalt Prescription Products

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> ***Usage in Pregnancy:*** **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

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Robert C. Knutson, M.D.

SEPTEMBER, 1977

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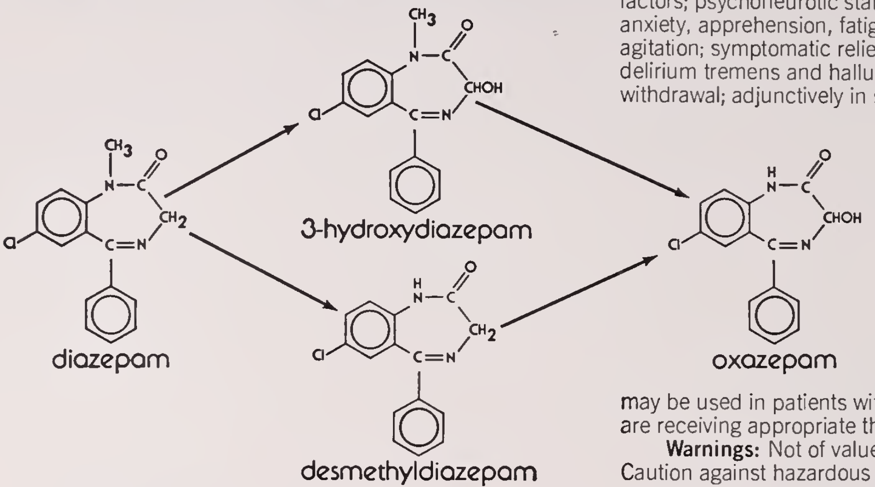

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Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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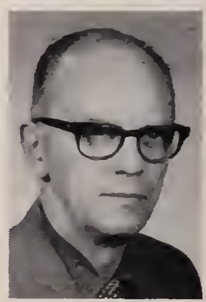
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Brief Synopsis of FDA Rules affecting the physician:

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President's Letter

National Health Care Insurance

National Health Insurance, Comprehensive Health Care Insurance, Health Security Act, Corman-Kennedy Bill, and many others have one thing in common—each accepts the basic premise that there is, in fact, a crisis in American health care and that a government program is necessary to correct it. Unfortunately, in my opinion, the crisis seems to be largely media and politically created. The "demand" for National Health Insurance (NHI) comes at a time when 86% of the people in this country are satisfied with their medical care as reported by the Bureau of Social Sciences Research.

Is National Health Insurance an idea whose time has come and gone? Politicians and bureaucrats have repeatedly recited the arguments in favor of National Health Insurance. These arguments are:

(1) The quality of American medical care is low.
(2) The expense is skyrocketing out of control, pricing health care beyond the means of many Americans.
(3) The government has the moral obligation to insure that good health care is available to everyone.
(4) The government therefore must exercise more control over the medical profession and insure that care is made available to all regardless of the cost.

In my opinion the advocates of National Health Insurance incorrectly interpret the problems facing American medicine, and their "cure" would be far worse than the disease. American medicine is not inferior at least not by any measurable standard.

American doctors are among the best trained in the world. American Hospitals are equipped as well as any. The most sophisticated procedures are routinely practiced in America. Most surveys show that only 12-15% of the total population, at a maximum, are dissatisfied with their access to care or the type of care they receive.

Health Care Costs have increased, but the major portion of that increase has been caused by government, either because of inflation or the result of Medicare-Medicaid legislation. "Free" medical care inevitably increases demand. From 1964-1973 hospitalization increased by almost 80%. Among poor adults, physician visits rose 25%. Hospitalization for the elderly rose 61%. We can say this indicates that more people had access to more care, because of the government's guarantee of payment. But more government will only produce higher costs or lower quality.

Great Britain and Sweden have been cited as examples where quality health care is universally available and the U.S. would do well to emulate their success. The British have controlled the cost of health care, but at the price of drastically reduced quality. Harry Schwartz, an authority in this field, writes that "by American standards the National Health Service is a meager and spartan medical system many of whose economics would be regarded as inhuman brutality if applied to America."

The Swedes, in contrast to the British, have not put a lid on cost. Not surprisingly, those costs have soared. Between 1950-1968 per capita health costs in Sweden increased by 912%. In Sweden, as in Britain, the wait for medical care is long and tedious. In short, government guarantees of free medical care inevitably mean cost increases or the quality and quantity of care decreases—or both. As one expert has written, "only paperwork and bureaucracy have flourished."

The third point, the government has the responsibility to provide good health to its citizens. Government *can* take money from its citizens. It *can* subsidize a mammoth medical establishment. It *can* build new hospitals and equip them. It *can* order the medical schools to produce hundreds of more doctors. It *can* make drugs and all medical procedures free and easily obtainable. *But it cannot guarantee health!* A healthy person is one who does not need to utilize the services of the medical profession.

A study done in Sweden several years ago and confirmed by a later study done in Southern California shows that health is unrelated to the availability of medical procedures. It is determined by living habits. Thus, to a greater degree than most people realize, illness and bad health are much less of a national problem than they are a personal one for each individual. This is the main reason that government-sponsored health programs *will not work*. Public education over a period of time may help, but today drinkers drink, eaters eat, smokers smoke, all are secure in the belief that some "miracle" medical procedure will save them from the consequences of their own acts.

Reflecting on these four points, will NHI accomplish what the "planners" hope it will? Looking at the track record of Britain and Sweden, it is very doubtful. Will the taxpayers of this country accept the cost-benefit package? Estimates of cost, depending on the plan, go all the way from nine billion dollars annually for just a national catastrophic plan to 20 to 25 billion for the AMA-sponsored plan to anywheres from 60 to 85 billion for the Corman-Kennedy plan. Are the benefits to be obtained worth the expenditure?

I think the statement made by NBC's David Brinkley in a speech at the Hinman Dental Meeting in Atlanta, Georgia, in 1975 says it all:

"If you want to keep any freedom of decision or choice, if you want to do your work without outside interference, if you would like to use your time your way rather than spending it keeping records and filling out forms and explaining why you did what you did, and whenever you are tempted by thoughts of money or improved public service and are tempted to turn to government, *don't*.! In the end you'll be sorry."

C A Anderson MD

C. A. Anderson, M.D.
President

Ramsey County Medical Auxiliary

"Theater of Fashions" is the theme of the Ramsey County Medical Auxiliary's style show luncheon to be held Thursday, October 6th, 11:30 a.m., Prom Center in St. Paul. Tickets are available from Margie Baab, 1 Gadwell Lane, St. Paul 55110. Fashions will be from Schlampp's of Minneapolis.

Proceeds will go to the Society for help in setting up a physician's office in an underserved area of St. Paul. Twenty-five physicians have donated time and equipment to make this office possible.

Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

The Editors

Editor's Notebook

On Having Your Head Examined

In April 1972, G. N. Hounsfield, Senior Scientist for EMI Ltd. of England, and James Ambrose, London Radiologist, sprung a technological tiger from its cage when they presented their work on the CAT scanner before the British Institute of Radiology. Hounsfield foresaw CAT scanners might start a radiologic revolution:[1]

> "It is possible that this technique may open up a new chapter in X-ray diagnosis. Previously, various tissues could only be distinguished from one another if they differed appreciably in density. In this procedure absolute values of the absorption coefficient of the tissue are obtained. The increased sensitivity of computerized X-ray section scanning thus enables tissues of similar density to be separated, and a picture of the soft tissue structure within the cranium to be built up."

As predicted, the CAT scanners started a diagnostic revolution, because of their cost (roughly $350,000 a year to operate), and ignited a feverish debate. From the following exchange, you can see the debate has become . . . well, catty.

> "CAT fever is a new disease entity that has a broad clinical spectrum. The predominant symptoms appear as a feverish impulse to own, operate, exploit or write about what has been known as Computerized Axial Tomography (CAT) but has now been renamed Computed Tomography."[2]

Stuart Shapiro, M.D. and Stanley Wyman, M.D.
Harvard Medical School, Boston, Massachusetts

> "We suggest Drs. Shapiro and Wyman (N Engl J Med 294:954-956, 1976) should personally undergo both pneumoencephalography and CAT study before pontificating about cost analysis concerning these procedures."[3]

David Hammond, M.D. and John Kelly, M.D.
St. Louis Medical Clinic, St. Louis, Missouri

Planners Versus . . .

Planners say those who run scanners are not calculating enough about balancing diagnostic yield and cost. Scanner people say planners ought to have their heads examined.

Planners are fond of saying England and Sweden have each less than a dozen CAT scanners — as if those countries had an ideal or optimal number. Or they are given to statements such as HEW Secretary Califano made in his recent AMA speech: "There are enough CAT scanners in Southern California for the entire western United States."[4]

Perhaps the planners' leading spokesman is Howard Hiatt, M.D., a microbiologist, who serves as Dean for the Harvard School of Public Health. He compares the health system to an overgrazed medical commons on which too many are foraging for too little.[5] There are limits to resources man can apply to medical care. Operating on that assumption, he sets forth these propositions:

- medical and health problems often have no technical solution, i.e. even the best technology cannot solve them.
- interests of individuals and society inevitably conflict, and, in the end, society's interests must prevail.
- to protect dwindling resources, careful studies of cost effectiveness and diagnostic yield must be done on medical technologies *before* those technologies are introduced to wide use.

Hiatt feels we already have too many CAT scanners, and those in use are of "unproven effectiveness." Here is a sample of his argument:[6]

"There is no doubt the scanners sometimes provide additional diagnostic information, and frequently with less discomfort and hazard to the patient. However, it is not clear that the diagnostic information very often leads to a better outcome for the patient. Until this important information is available (from careful studies), would we not be better served by limiting the use of such expensive technology."

For my own mnemonic purpose I call the planner's philosophy REAL PROTECTANT, for "Resources are limited. Productivity and technology together are not trustworthy."

. . . Scanners

On the other side of the debate are physicians, practitioners or neurosurgeons who refer patients for CAT scans or radiologists or neurologists who interpret scans. Unlike Hiatt, physicians feel diagnostic problems yield to technical solutions; interests of individual patients take immediate priority, rather than abstract concerns of society; and diagnostic worth and patient impact of certain technologies are self-evident or can only be evaluated while that technology is evolving.

Instead of explaining physicians' positions, I shall let them speak for themselves. I have selected writings from well-known medical journals (For selfish reasons, I place journal number one in the "well-known" category. It is, after all, well-known to me).

"There is no question that computerized tomographic scanning is of immense value in the diagnosis of brain tumors. As a screening procedure for cerebral neoplasm it is rapid and painless, and has an overall accuracy that equals or exceeds other neuro-radiologic modalities. Except for certain tumors, including small intrasellar and suprasellar lesions and subtle expansions involving the brain-stem, the overwhelming majority of intracranial neoplasms have been accurately identified with CT-scanning. We have seen a number of cases of tumor demonstrable only by CT-scanning, and not by angiography and/or isotope brain scanning. The extent of a neoplasm is frequently far better revealed by CT-scanning than by other radiologic or isotope examinations. The multiplicity of metastases has been demonstrated frequently by CT scanning when angiography or isotope brain scanning has revealed only a solitary lesion."

R. E. Latchaw, M.D., L. H. A. Gold, M.D. and E. J. Tourje, M.D.
"Computerized Tomography of Intracranial Tumors"
Minnesota Med., 60: 554-559, 1977.

"Within weeks after installation of the first CT head scanner at this institution, in June 1973, it became clear that the technique was at the very least dramatic and probably revolutionary. The superiority of the image obtained was apparent to all, and the early CT head scanners caused intense interest not only among radiologists but also among others with no training in radiation physics, radiation protection, or medical imaging procedures. Subsequently, CT scans of the head have proved generally superior to other radiographic tests as an early examination in the patient who has possible intracranial disease."

"As medicine becomes increasingly involved with politics and economics, we shall no doubt see increasing use of such terms as "cost effectiveness" and "cost-benefit ratio" which attempt to relate diagnostic cost and therapeutic benefit. Cost can easily be defined in terms of dollars. Unfortunately, there is no currency with which to quantitate effectiveness or benefit. Arbitrarily, benefit may be defined as fewer hospital days or longer life span. But how does one quantitate suffering, anxiety, a sense of well-being, or the quality of one's remaining days? What, in truth, is the benefit of detecting several new cases of pancreatic carcinoma or of determining that a patient's symptoms are due to an inoperable astrocytoma rather than a massive brain infarct? In fact, one of the greatest benefits relative to cost may be not in detecting the pancreatic mass or brain tumor but in obtaining a CT scan that shows no such anatomic cause for the patient's abdominal pain or headaches."

John K. Crowe, M.D.
"Scanning and Planning"
Mayo Clinic Proceedings, 52:399-400, 1977

> "The "CAT Disease" is one that should spread. It saves time in diagnostic research and often eliminates exploratory operations. The emotional stress of an exploratory operation, the cost of the procedure, and the time of recuperation are certainly worth the cost of the CAT. The minimum hospital stay for "guess surgery" is one week, after which a program for remission or recovery must begin. With CAT after two days of testing, the problem can be pinpointed, and the medical staff can begin a recovery program. Eliminated are the emotional pain and the physical incapacity of exploratory operation.
>
> The choice between cutting a patient open and x-raying him is clearly a choice between using primitive means and modern technology. We are living in inflationary times and spending billions of dollars to photograph the moon. I do not understand how x-raying a person can be considered an extravagance unless Drs. Shapiro and Wyman consider human dignity a cheap commodity."

Steven L. Levinson, M.D.
"Some Like CAT Fever."
New Engl J Med., 295:280, 1976.

CAT Purchases

You have now heard both sides of the debate, or at least excerpts of them. But you have not yet seen figures showing how the debate has influenced CAT fever. Planners may have dampened the fever, but not much, for it is still spiking.

By August 1976, the United States Office of Technological Assessment reported physicians had installed 321 scanners, ordered 330 more, and were awaiting approval on 200. By the end of 1977, there will be about 1400 scanners in the country, and by 1980 maybe 2500. Almost all recent purchases are body scanners. New scanners are more expensive, costing about $700,000.[8] As matters now stand, less than 40 percent of Blue Cross Plans, as well as Medicare, reimburse for whole body scans.[9]

Cost

Cost to society?

No one knows for sure, and the answer depends on what you assume or what you want to find. Where you stand depends on where you sit. Take these examples:

- Hiatt of the Harvard School of Public Health estimates yearly operating cost at $500,000: He adds: "If 5,000 hospitals were each to purchase one CAT scanner, the total operating expenditure would equal $2.5 billion per year for this single piece of equipment."[6]
- Creditor and Garrett of the University of Illinois College of Medicine, who assume 2750 scans per unit and the current average interpretation fee, estimate 1977 cost at $924 million and 1980 cost at $1.65 billion.[7]
- Wortzman, Holgate, and Morgan, radiologists at Toronto General Hospital, reviewed 444 patients undergoing CAT scan and found 170 air studies and 171 angiographic procedures were made unnecessary, admission was not necessary for 58 percent of outpatients, and hospital stay was shortened significantly for inpatients. These radiologists estimate a single CAT scanner "can effect savings of up to $2,000,000 a year."[10]
- Evens and Jost, radiologists at Mallinckrodt Institute of Radiology in St. Louis, surveyed 98 CAT installations in January 1976. They estimated total technical yearly costs of $325,000 to $371,000 per installation. Estimated technical revenues were within the same range. These revenues came from technical charges of $138 per CAT scan. Evens and Jost were uncertain about "cost-effectiveness," but found reductions of 66 percent, 34 percent, and 29 percent in pneumoencephalograms, angiograms, and radionuclide brain scans at Mallinckrodt Institute.
- Jonsson and Marke, Research Associates at the Swedish Planning and Rationalization Institute (SPRI) in Stockholm, calculated CAT scanners would reduce pneumoencephalograms by 70 percent and cerebral angiograms by at least 50 percent.[12] "In this case," says the Swedes, "the annual savings in operating costs for the whole country would be roughly Swe. kr. 15 million." In the U.S. dollars, that translates to $3.3 million.
- J. Ambrose, M. R. Gooding, and D. Uttley, London radiologists, reported these

dramatic reductions in 100 consecutive head injury victims before CAT Scans and 100 consecutive similar patients after CAT Scans.

TABLE

	Exploratory Surgery	Definitive Surgery	Arteriograms	Air Studies	Technitium Scans	Total Procedures
Before scans (1971)	33	14	35	4	22	108
After scans (1975)	2	13	8	0	8	31

Final Examination

Having just tracked CAT, how do I feel about it? First, I am distressed critics heed CAT costs, but not CAT savings. If CAT scans reduce other neuroradiologic procedures by 50 to 70 percent, as clinical experience in many countries so far indicates; and if CAT scans cut the number of lumbar punctures, allow neurological workups to be done outside hospitals, speed those evaluations done inside hospitals, and lessen the number of exploratory or invasive procedures, then these cost savings ought to have a more prominent place in planners' public utterances. I have a strong hunch these savings come close to purchasing and operating costs.

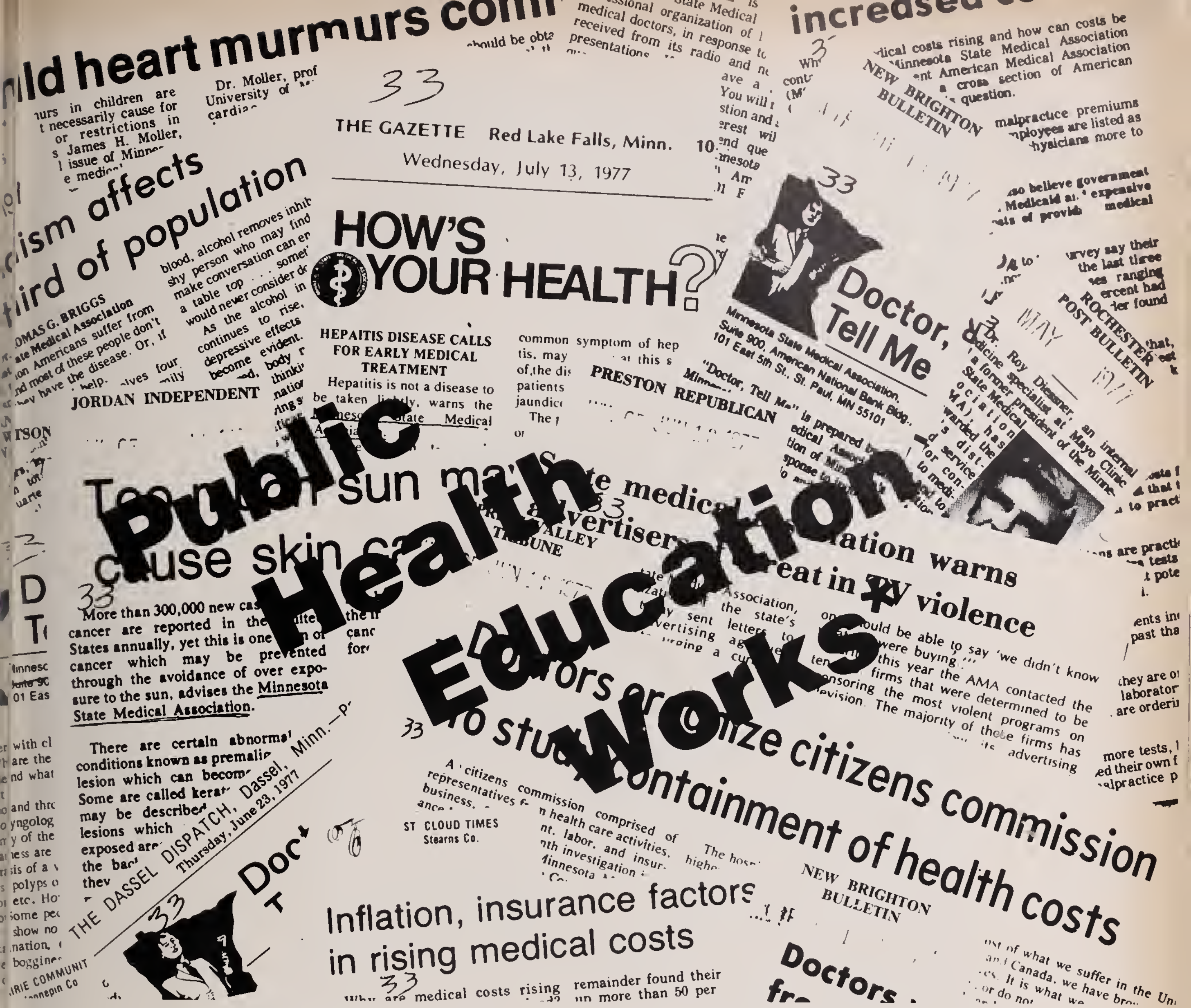
Second, I feel planners are fighting a losing battle. Why? Two reasons: (1) patients and doctors will continue to demand a technology that does a superior job of examining human organs with almost no danger or discomfort; and (2) forces for innovation and technological development are too strong a part of human drive and curiosity to deny.

Besides, planners do not have the foresight or power to bring a technology to a standstill, study it, and say where it will lead. This task is beyond planners' intellects and imaginations. Planners forget the CAT scanner itself is an unpredictable byproduct of space technology. You simply cannot accurately forecast technological impacts or side effects *before* going ahead with a technology. All you can say is technology will bring change. I am confident this change will be for the better.

Richard L Reece MD

References

1. Hounsfield, GN: Computerized transverse axial scanning (tomography). Part I. Description of system. British J Radiology, 46:1016-1022, 1973.
2. Shapiro, S and Wyman, SM: CAT fever. New Engl J Med, 294:951-956, 1976.
3. Hammond, D and Kelly J: Some like CAT fever. New Engl J Med, 295:280, 1976.
4. Califano, J: Remarks before American Medical Association. Minnesota Med 60:601-605, 1977.
5. Hiatt, H: Protecting the medical commons: Who is responsible? New Engl J Med 293:235-241, 1975.
6. Hiatt, H: Too much medical technology? Wall Street Journal Editorial page, June 24, 1976.
7. Creditor, MC and Garrett, JB. The information base for diffusion of technology, computed tomography scanning. New Engl J Med, 297:49-52, 1977.
8. Fineberg, H et al: CAT scanners: distribution and planning status in the United States. New Engl J Med, 297:216-218, 1977.
9. BCA Survey of Plans on Computerized Tomography (CAT) Scanning: March 23, 1977, Health Care Services, Blue Cross Association, Chicago, Illinois.
10. Wortzman, G et al.: Cranial computed tomograph: an evaluation of cost effectiveness. Neuroradiology, 117:75-77, 1975.
11. Evens, RG and Jost, R: Economic analysis of computed tomography units. Amer J Roentgenol 127:191-198, 1976.
12. Jonsson, E and Marke, L-A: CAT Scanners: the Swedish experience. Health Care Management Review, 2:37-53, 1977.
13. Ambrose, J et al.: EMI scanning in the management of head injuries. Lancet, 1:847-848, 1976.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Blood Pressure in Children

THOMAS A. LOVE, M. D. and JAMES H. MOLLER, M. D.*

The recording of blood pressure should be a routine part of the pediatric examination to detect the two per cent of children with hypertension, so that proper diagnostic and therapeutic steps can be taken.

BLOOD PRESSURE is often not recorded during a pediatric physical examination. There are several reasons. Physicians generally consider hypertension a disease of adults, not children. Secondly, children are often fussy or crying during physical examination so blood pressure is difficult to obtain or inaccurate. Finally, appropriate size blood pressure cuffs are frequently not available.

An experience in a pediatric office practice indicates that two percent of children have an elevated blood pressure[1]. In most of these children, the elevation persists over a period of time. Not only is hypertension found in children, but in contrast to adults, in two-thirds of the children a definable and often correctable cause for the hypertension exists. Therefore, the child identified as hypertensive should be thoroughly evaluated.

In this paper, we wish to emphasize the need for recording accurate blood pressure in children, to describe methods for obtaining blood pressure in this age group, and to outline the management of children found to be hypertensive.

Recording Blood Pressure

Appropriate equipment is needed for recording blood pressure properly. The blood pressure cuff must be of proper size because too small a cuff falsely elevates blood pressure readings and too large a cuff lowers readings[2]. The errors introduced by an inappropriate sized cuff are greater and occur more frequently with too narrow a cuff. A blood pressure cuff is comprised of a cloth enclosure and an inflatable bag. The latter when inflated compresses the artery. The bag portion should cover at least two-thirds the length of that portion of the extremity being measured and encompass at least half, and preferably more, of the circumference of the extremity. Therefore, the size of cuff used will depend on the size of the child's arm. Since children vary so greatly in size, several sizes of blood pressure cuff should be available to physicians examining children. In general, the largest size cuff that can be placed comfortably on the arm should be used. The following guidelines should be approximately correct for the various ages:

Age Group	Cuff Width
Infant	2″ (5 cm)
1-5 yrs.	3″ (7 cm)
5-12 yrs.	4″ (9½ cm)
Older children and adults	5″ (''adult'' 12½ cm)

Although a one-inch wide cuff is also commercially available, this cuff is too small, gives erroneously high values and should never be used.

The cuff should be snuggly applied to the extremity and the pressure rapidly inflated in the bag. A loosely applied or slowly inflated bag will falsely lower blood pressure readings. The rate of release should be about 2-3 mmHg/sec., and the cuff deflated completely to zero. The physician or nurse should pause before reinflating the cuff. Failure to completely deflate the cuff introduces systematic errors.

The site at which the blood pressure reading is being obtained should be at the same level as the heart, regardless whether the patient is sitting or reclining. If the extremity is significantly above or below heart level, the blood pressure is falsely lowered or raised respectively by as much as 20 or 30 mmHg. Therefore in the seated patient the antecubital area should be at heart level.

Auscultatory Method

In children, blood pressure readings can be obtained by one of three methods: (1) auscultatory; (2) pal-

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A Grand Rounds presented at St. Paul Children's Hospital

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See editorial, page 657.

patory; or (3) flush. By the conventional auscultatory method a stethoscope is placed below, but not touching, the cuff, and the recorder listens for transmitted Korotkoff sounds. The reading at which one hears the initial sound represents the systolic pressure. The pressure reading at which the sounds change in character and at which they disappear should also be noted and recorded. Although there is disagreement about which of the values reflects diastolic pressure, intra-arterial diastolic pressure is usually slightly less than the value at which the Korotkoff sounds muffle.

Palpatory Method

In using the palpatory method, the pressure cuff is inflated and then slowly released until the pulse, distal to the cuff, becomes palpable. The reading at which the pulse appears indicates the systolic pressure. Diastolic pressure cannot be determined by this method. The palpatory method is useful in determining the systolic pressure of small children and as a check of auscultatory values in older children.

Flush Method

Blood pressure is obtained in infants by the flush technique. A blood pressure cuff is applied to the *forearm*. The infant's hand is squeezed by the examiner to express blood from it. While the hand is still being compressed, the cuff is rapidly inflated. The compression of the hand is then released by the examiner. The hand will appear blanched since blood has been expressed from it. The cuff is then slowly deflated and the blanched hand observed. The hand will suddenly flush, and the pressure reading at this point indicates the mean arterial pressure. This method is useful in neonates and infants. It is reliable and simpler than the auscultatory method.

Since anxiety causes a rise in blood pressure, the blood pressure should be obtained toward the end of the physical examination and with the child quietly resting on the examining table or perhaps even after he has dressed.

Normal Range

The normal range of blood pressure for children is different from those in adults and varies with the child's age. Adult patients are considered to be hypertensive if their blood pressure exceeds 140/90 mmHg, but lower values are used for children. The figure shows the mean and two standard deviation levels of the systolic and the diastolic blood pressures for children beyond the age of four years. If a child's blood pressure, either systolic or diastolic, exceeds the 95th percentile, this child should be carefully evaluated.

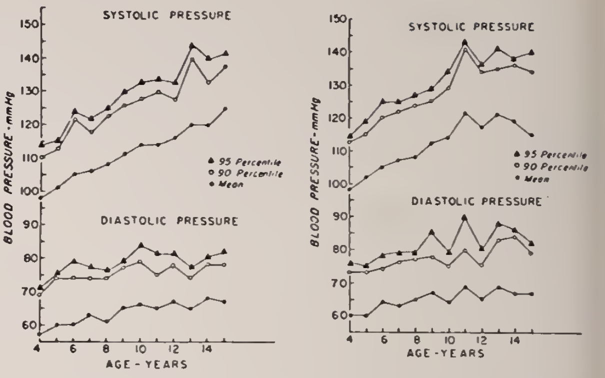

Figure — Normal values for systolic and diastolic blood records at various ages in childhood. Males left, females right. (From Londe[3], with permission).

Evaluating the Hypertensive Child

The initial step in evaluation should be to recheck the blood pressure on several different occasions. If persistently elevated, further investigation should be undertaken to establish possible causative factors.

Once hypertension has been identified by carefully applying the methods described above, the child should be considered to have secondary hypertension until proven otherwise. Essential hypertension is uncommon in the pediatric population. Diligent investigation and careful clinical follow-up of the hypertensive child often results in the discovery of an etiology.

Renal Disease

In children, hypertension most commonly results from renal disease, and this can be classified into three groups: (1) unilateral renal disease from unilateral renal artery stenosis or unilateral pyelonephritis; (2) bilateral renal disease, such as chronic pyelonephritis, glomerulonephritis or vasculitis; (3) diseases affecting renal blood flow or renal parenchyma in an unknown way, such as coarctation of the aorta, hydronephrosis or renal hypoplasia[4].

In common, these conditions probably lead to hypertension by reducing renal parenchyma blood flow. This reduced flow results in reduced glomerular filtration rate and increased sodium and water reabsorption. In addition, there is increased renin excretion from the affected kidney causing increased aldosterone production and hypertension. If the renal disease is unilateral or a vascular problem is present which affects both kidneys and produces ischemia, repairing the vascular obstruction or removing the diseased renin-secreting kidney should correct the hypertensive problem[5].

Approaching the patient with chronic bilateral renal disease is more difficult[6]. Nevertheless, diligent medical management, dialysis or renal transplantation can lead to a happy, productive patient. Many patients kept free of infection, treated with appropriate antihypertensive medication and advised about dietary regimens, can be greatly improved[7].

Endocrine Disorders

A variety of endocrine disorders lead to hypertension, but these are uncommon. The adrenogenital syndrome, with elevated 17 keto-steroid excretion, and Cushing's syndrome, with increased 17 hydroxysteroid production, can lead to hypertension. Iatrogenic Cushing's disease in children treated with chronic steroid therapy can lead to elevated systolic and diastolic blood pressure. Aldosterone producing tumors and pheochromocytoma, although rare in children and difficult to diagnose clinically, do lead to hypertension. Rare causes of hypertension such as brain tumor, Riley-Day syndrome, lead poisoning, porphyria, mercury intoxication, acute reaction to sympathomimetic amines or blood transfusions should also be remembered.

Many conditions cause hypertension in children. The study and investigation of these problems may be intricate, expensive and occasionally unrewarding. As we learn more about the natural history, etiology and pathogenesis of this clinical problem, the number of negative studies should diminish. Diligent pursuit and extensive early investigation are emphasized. A suggested plan of investigation is presented to aid in the orderly and efficient diagnostic evaluation of the hypertensive pediatric patient (Table).

TABLE

Basic Diagnostic Studies for Evaluation of Persistent Hypertension

Outpatient
- **A. History and physical examination**
- **B. First morning urine sediment**
- **C. Discontinue medicines and diuretics one week prior to study**

Inpatient

Hospital Day I
- **A. CBC, sedimentation rate, urine analysis, urine culture, SMA 12**
- **B. Chest x-ray, electrocardiogram, immunoelectrophoretic assay**
- **C. 24 hour urine for creatinine clearance and urinary protein**
- **D. Plasma cortisol, peripheral renin**

Hospital Day II
- **A. Rapid sequence IVP — films one minute, two minutes, 2½ minutes, three minutes; then routine**
- **B. 24 hour urine collection for endocrine assay based on history and physical**

Hospital Day III
- **A. Aortogram and renal vein renins**

History and Physical

The evaluation of a case of hypertension begins with a careful history and physical examination. These may identify specific findings which direct the investigative approach. For example, hirsuitism and obesity suggesting Cushing's syndrome, an abdominal bruit — a renovascular anomaly, history of periorbital edema — renal disease, or positive family history are starting points. Every hypertensive child should have blood pressures recorded in both arms and a leg to exclude coarctation of the aorta.

Urinalysis

The first morning urine sediment should be carefully evaluated, for this more concentrated specimen will often reveal abnormalities not seen in a specimen obtained at midday from a hydrated patient. In addition, a carefully obtained midstream urine for culture should also be obtained.

Other Tests

Serum electrolytes and BUN should be drawn. A creatinine clearance and a rapid sequence IVP should be performed. Aortography and renal vein renins are sometimes indicated. Appropriate endocrine assays must be pursued if the initial survey is nonproductive.

General Treatment

Treating the child, hypertensive from an identifiable cause, is often clear although at times difficult. The unsettled question remains how to manage children whose blood pressures are in the upper ranges of normal. Children with blood pressure in the upper range of normal in early childhood tend to be consistently in the upper range of normal as they become older[5]. Blood pressure rises with age, and the rate of rise is determined more by the prevailing level of pressure than the age. Therefore, patients with high levels of blood pressures show a more rapid rise than those patients with initially lower pressures. Therefore, physicians should be concerned about the children with higher levels of blood pressure, although whether preventive measures will lead to reduction in the level of blood pressure or the complications of hypertension remain to be proven.

Several factors have been identified which accelerate hypertension or its complications:

Obesity accelerates hypertension and overweight children become overweight adults.

Excess sodium intake is associated with a significantly higher incidence of hypertension.

Smoking accentuates hypertension.

A positive *family history* for hypertension favors the development of hypertension, for close relatives resemble each other in regard to blood pressure, as in other physical characteristics, and children resemble parents in blood pressure readings.

Atherosclerosis is accelerated in hypertension.

In children, it may be wise for the physician to discuss the implications of obesity, excessive salt intake and use of tobacco, particularly in families with a positive family history of hypertension.

Conclusion

The natural history of hypertension in childhood is largely unknown, but until better defined, we believe that: (1) blood pressures should be obtained in all children as a routine part of the physical examination; (2) blood pressure should be obtained properly; (3) the identified hypertensive child should be fully evaluated and treated; and (4) preventive measure will perhaps be shown of value for borderline hypertensive children.

References

1. Londe S, Bourgoignie JJ, Robson AM and Goldring D. Hypertension in apparently normal children. J Peds 78:569, 1971
2. Kirkendall WM, Burton AC, Epstein FH and Freis ED: Recommendations for human blood pressure determination by sphygmomanometers. American Heart Association, 1967
3. Londe S: Blood pressure in children as determined under office conditions. Clin Pediatr 5:71, 1966.
4. Loggie JMH. Hypertension in children and adolescents. I. Causes and diagnostic studies. J Pediatr 74:331, 1969.
5. Kaufman JJ, Goodwin WE, Waisman J and Gyepec MT: Renovascular hypertension in children. Am J Surg 124:149, 1972
6. Loggie JM. Hypertension in children and adolescents. II Drug therapy. J Pediatr 74:640, 1969.
7. Truman JT, Baker GP, Crawford JD, Leadbetter GW, Page LB and Soyka LF Hypertension in children. Etiology and investigation. Cl Pediatr 2:189, 1963.

1978 MSMA Annual Meeting

May 11-12, Duluth, Minnesota

There've been some changes made . . .

Remember the 1974 Annual Meeting in Duluth? So much has happened since then to make another visit worthwhile that St. Louis County Medical Society, in cooperation with their neighbors from the Range Medical Society, have extended an invitation to us for 1978.

Dr. Josiah Fuller, President of the St. Louis County Society, has gotten plans moving by appointing a Duluth internist, Dr. Ted Johnson to serve as Local Arrangements Chairman for the meeting.

Our hosts are already touting the expanded Arena-Auditorium complex, larger Radisson Hotel, and Spirit Mountain Recreation Area — a nice place to visit and enjoy the view all year round, even if you aren't a skier. There's another new facility due to open soon: The Normandy Hotel. An enclosed skyway system connects it to the Arena for comfortable indoor walking convenience no matter what the weather. And the Duluth Playhouse has found a new home with the St. Louis County Heritage and Arts Center. Indeed, four years has brought a new face to the Port City.

Change is not unique to Duluth, I might add. Time was when all we needed was an exhibit hall, a place to hold the program's general session, and space for the House of Delegates and the Annual Banquet. It's just possible that those of you who haven't attended an MSMA Annual Meeting in awhile might find things are a little different in that category too.

Planning has begun. Representatives from many of Minnesota's medical specialty societies are joining our Subcommittee on Scientific Assembly to develop program sessions to meet the educational needs of our state's physicians. You'll be hearing from us again and again in the months ahead as meeting plans take shape and the dates draw nearer. We aim to make the 1978 Annual Meeting in Duluth the kind of success you won't soon forget. Keep watching and listening for more information.

Your friends from the St. Louis and Range Medical Societies and the Subcommittee on Scientific Assembly invite you to come to Duluth next May. It's an old familiar tune, but there've been some changes made.

S. V. Thorson, M.D., Chairman
Subcommittee on
Scientific Assembly

Plastic Deformation of the Forearm in Children following Trauma

MICHAEL W. DAVIS, M.D.,* THOMAS LITMAN, M.D.,* and ROBERT M. BARNETT, M.D.*

Bowing of a child's forearm without evident fracture will occasionally occur following trauma. Two illustrative cases are presented.

INJURY TO A CHILD'S forearm with resultant plastic deformation but without fracture is a rare occurrence. Of the two standard textbooks on children's fractures, the first does not describe this condition[1], and the second mentions it only in passing without illustrative example.[5] The only published account of this entity is that of Borden in 1974.[2] He described eight children with traumatic bowing of the forearm. We would like to report two additional cases.

Case Reports

Case 1

A 14-year-old boy fell off his bicycle. Another bicyclist closely following him rolled over his left forearm. He sustained a bowing injury of the radius and ulna without fracture. A cast was applied with no attempt at reduction. Twenty-two days later the patient was referred to us because of the deformed forearm. Roentgenograms taken at that time revealed plastic deformation of the radius and ulna with no evidence of fracture and no periosteal reaction (Figure 1). The following day a closed reduction of the forearm was attempted under general anesthesia. Only with great force was a partial reduction of the deformity achieved. No cortical "crack" was heard or felt. The patient was kept in a long arm plaster cast for six weeks. At the time of his last examination seventeen weeks post injury he had a minimally bowed forearm with essentially normal function and no limitation of pronation or supination. Roentgenograms taken at that time were unchanged from films taken immediately post reduction (Figure 2).

Case 2.

A 13-year-old boy fell off a skateboard and sustained a mild bowing injury of the right radius without apparent ulnar involvement (Figure 3). No attempt at reduction was made and he was kept in a dorsal plaster splint for three weeks. Final roentgenograms taken five months later were unchanged. No residual functional deficit was evident.

Discussion

The mechanical properties of adult and children's bone are obviously different. Greenstick fractures and traumatic plastic deformation have not to our knowledge been seen in adults. Hirsch and Evans[4] studying wet children's bone showed that the tensile strength and

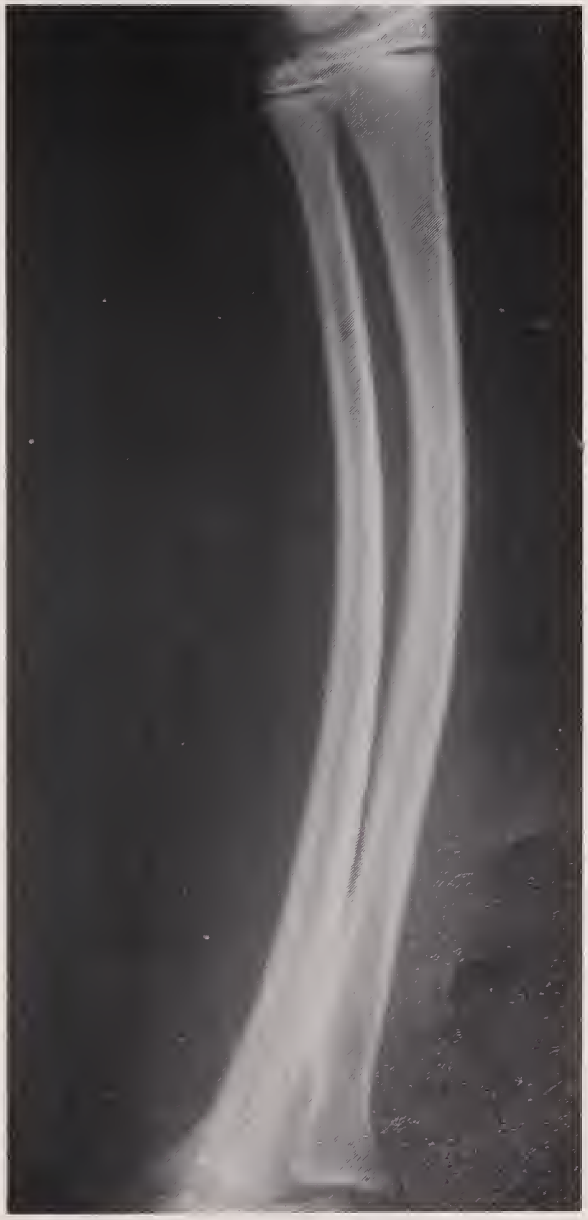

Fig. 1—Plastic deformation of radius and ulna.

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*Minneapolis, Minnesota

modulus of elasticity of bone tissue was lower in the infant than in the teenager. Vinz[6,7] studied wet bone in subjects ranging from newborn to eighty-five years of age. He found that the tensile strength and modulus of elasticity increased with age up to about forty and then began to fall in the seventies and eighties. There was also a gradual increase in mineralization with age. Currey and Butler[3] studied portions of femur taken from subjects between two and forty-eight years of age. Children's bone had a lower modulus of elasticity, a lower bending strength and a lower ash content than adult bone. Young bone absorbed more energy before breaking because of its great ability to undergo plastic (rather than elastic) deformation. The lower ash (mineral) content in young bone could explain its ability to undergo plastic deformation without fracture.

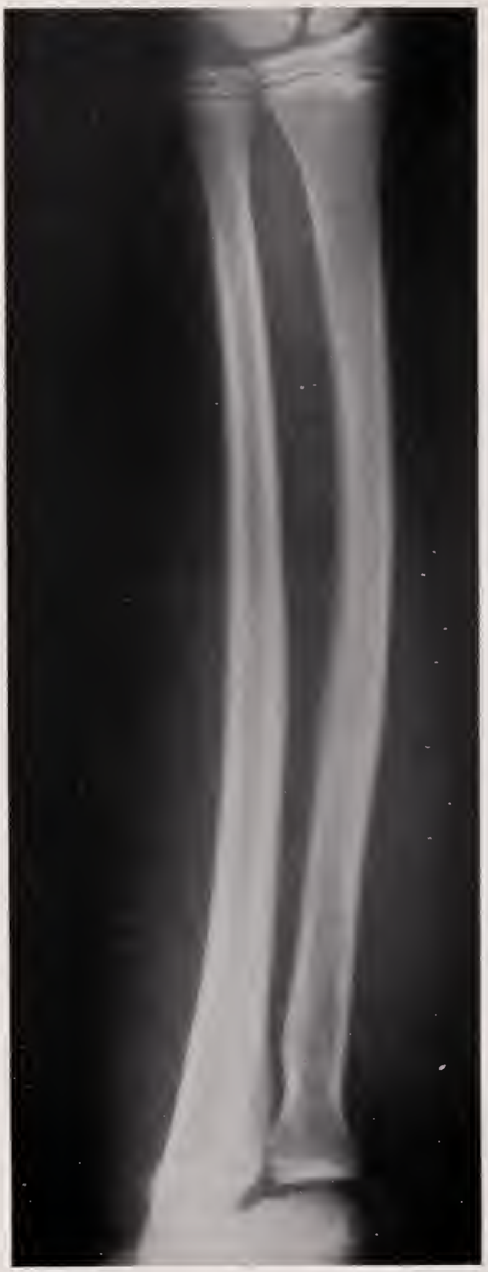

Fig. 2.—Seventeen weeks post injury there is minimal residual bow.

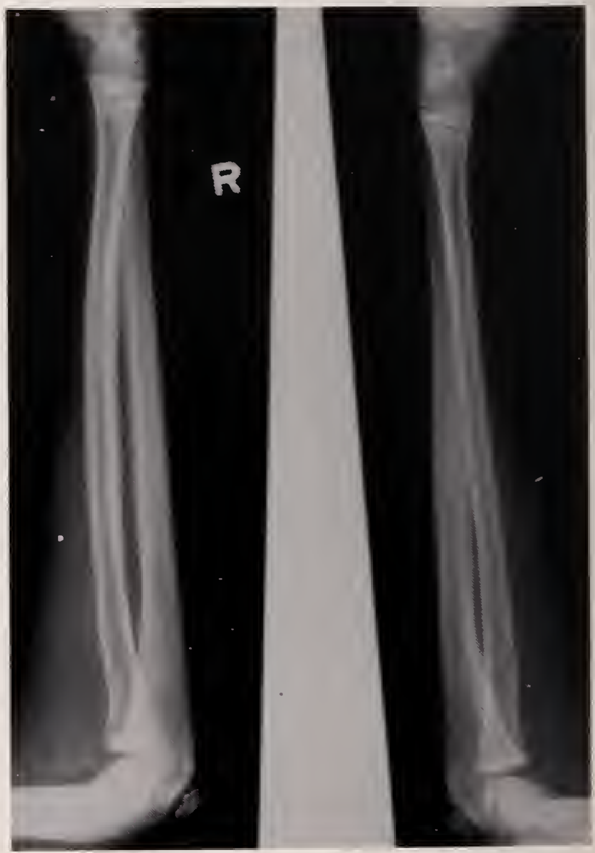

Fig. 3.—Bowing injury of right radius without ulnar involvement. Opposite forearm shown for comparison.

References

1. Blount, WP: Fractures in Children. Baltimore, The Williams and Wilkins Co., 1955.
2. Borden, Spencer, IV Traumatic Bowing of the Forearm in Children. J Bone and Joint Surg 56-A:611, April 1974
3. Currey, JD, and Butler, G: The Mechanical Properties of Bone Tissue in Children. J Bone and Joint Surg, 57-A:810, September, 1974.
4. Hirsch, Carl and Evans, FG: Studies on Some Physical Properties of Infant Compact Bone Acta Orthop Scandinavica 35:300, 1965.
5. Range, Mercer: Children's Fractures. p. 2. Philadelphia-Toronto, JB Lippincott Co, 1974
6. Vinz, H: Die Änderung der Festigkeitseigenschaften des Kompakten Knochengewebes im Laufe der Altersentwicklung. Gegenbaurs morphol. Jahrb, 115:257, 1970.
7. Vinz, H: Die Festigheit der reinen Knochensubstanz. Naherungsverfahren zur Bestimmung der auf den holheraumfreien Querschnitt bezogenen Festigkeit von Knochengewebe. Gegenbaurs morphol Jahrb 117:453, 1972.

Rheumatoid Arthritis in Children

Management
(Physiatrist's View)

A. TURKYILMAZ OZEL, M.D., M.S.[*] and FREDERIC J. KOTTKE, M.D., Ph.D.[+]

The management of rheumatoid arthritis in children which aims to reduce inflammation, preserve function, prevent deformity and maintain optimal potential for normal living physically, psychologically, socially, educationally and vocationally requires continuous and cooperative effort from the patient, family and rehabilitation team. Management of rheumatoid arthritis in children is summarized with a special emphasis to its rehabilitative aspect.

IN THE MANAGEMENT of rheumatoid arthritis the main objectives are to reduce inflammation, preserve function, prevent deformity and maintain optimal potential for normal living physically, psychologically, socially, educationally and vocationally. Management of rheumatoid arthritis in children has some specific problems and presents a particular challenge to the physician.

In this article the basic points of the management of rheumatoid arthritis in children will be summarized with a special emphasis to its rehabilitative aspect.

Education of Patient and Family

The management of rheumatoid arthritis which is of long duration requires continuous and cooperative efforts of the patient, family and rehabilitation team to minimize crippling. Unless the nature, course and prognosis of the disease as well as the rationale for its treatment are fully understood by the family and the patient (if the patient is old enough) an effective program cannot be established. Also, despair of the patient and family may lead them to abandon therapy and may result in more severe disability. Therefore, education of the patient and family has critical importance for the success of treatment.

Rest

It has been shown that articular rest through immobilization of the extremity up to 3-4 weeks resulted in more rapid alleviation of the local signs of arthritis.[1–4] Also, in the case of peripheral nerve injury,[5] hemiplegia [6,7] and poliomyelitis[8] preceding the onset of rheumatoid arthritis, the manifestations of rheumatoid arthritis were not seen in the paralyzed area.

Since 50 to 70 percent of children with rheumatoid arthritis eventually showed remission or complete recovery[9,10] protection of joints is extremely important. If joints are inappropriately used during the time of acute inflammation damage to the joints is inevitable and this impairment remains after the remission of the systemic disease.

In the acute stage, patients tend to hold their joints in a semiflexed position that promotes flexion contractures. Both articular rest and prevention of deformities can be accomplished by good positioning and appropriate support with splinting for both upper and lower extremities. Posterior molded splints are made to keep the knees in full extension and ankle at a 90° neutral position. Palmar splints provide good alignment for hand and wrist joints. Later on, in the chronic stage this may be replaced by a palmar cock-up splint with an ulnar support to prevent wrist subluxation and ulnar deviation which are common deformities in rheumatoid arthritis. Plaster of Paris splints can be made to provide a good support, alignment and rest for any joint. If there is active inflammation in the joints in the lower extremities, the patient should be confined to a wheelchair until the inflammation diminishes.

After prolonged immobilization contractures of both the muscle and the joint capsule are responsible for the restriction of motion, with the shortening of muscle being primarily at fault.[11] The intra-articular effects of prolonged immobilization have been studied in animals[11–15] and in humans.[16] It has been shown that proliferation of intracapsular connective tissue and the formation of adhesions occur early. Forceful mobilization of a joint following prolonged immobilization results in tearing of the connective tissue that has proliferated within the joints and in evulsion of pieces of articular cartilage.[11,16] Therefore, gentle range of motion exercises, at least twice daily, should start as soon as the patient's condition permits.

The value of systemic rest is controversial.[1,17] The

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See editorial, page 657.

authors of this article believe that systemic rest and refuge to a warm environment are the natural human responses to any severe systemic disease; therefore, systemic rest in a warm environment should be exercised in the very acute stage of juvenile rheumatoid arthritis. The experience in the Department of Physical Medicine and Rehabilitation of the University of Minnesota is supportive of this conclusion.

Heat

Heat is used to relieve pain and soreness, to decrease spasm, to overcome stiffness, and to prepare for exercise. Moist heat generally is tolerated better than dry. Since the treatment program must be carried out as long as the disease is active it is better to select a means of applying heat that can be used at home. Hot packs, a body baker, tub immersion baths, paraffin, or a whirlpool bath are most likely to fulfill this criterion.[18] In our department we prefer to use the whirlpool. It is easy to immerse the total body into the water and it is possible to manipulate the temperature of the water until the maximum temperature that can be tolerable to the patient is achieved. It is known that the higher the temperature up to 106°F for 20 to 30 minutes the better the effect.

Exercise

Maintenance and Improvement of Range of Motion.

As soon as the patient's pain permits all joints should be carried passively through the full range of motion by the therapist or member of the family. This passive motion through the painfree range is repeated three times for each involved joint twice daily. The greater the inflammation and pain the more gentle and slower the passive motion must be. Exercise should not cause any pain. As the patient's condition improves the range can be increased slowly with gradual progression to active assistive exercise and then to active exercise. Inappropriate exercise or over-exercise may impede rather than help recovery in the acute stage.[19]

Sometimes contractures occur and deformities develop. Connective tissue has a very high tensile resistance to an applied tension of short duration. However, if it is placed under prolonged mild tension it shows plastic elongation. Techniques for effective stretching of contractures are based on this plastic property of the connective tissue to elongate when exposed to prolonged moderate tension.[20] However, since inflammation in any joint may reduce the tensile strength of the capsule and collateral ligaments to as little as 50 percent of the normal tensile strength[21] stretching cannot be performed in the acute stage. When it is applied after the inflammation diminishes it should be much more gentle and should not produce pain in the joint.[19] Stretching of knee flexion contracture which consists of tightness of knee flexors, posterior joint capsule and anterior cruciate ligaments has a particular importance in juvenile rheumatoid arthritis.

If the rotatory force is applied to the distal part of the leg for manual or prolonged stretching posterior displacement of tibia on femur may occur as the result of tightness of the posterior capsule and anterior cruciate ligament. Therefore rotatory force should be applied close to the knee to stretch the tight connective tissues effectively and allow the tibia to glide forward into the normal relationships with the femoral condyles.

Maintenance and Improvement of Muscle Strength.

Muscle strength may be lost up to 5.5 percent per day in complete immobilization.[22] Thirty days of immobilization of the forearm of a healthy man resulted in a 44 percent decrease in grip strength.[23] In the very acute stage of rheumatoid arthritis patient inhibits muscular contraction because of severe pain and therefore, he loses strength. Until the acute inflammation is overcome he cannot exercise effectively and he would most likely cause permanent damage if he did so. As soon as rest, thermotherapy and medication have reduced the acute inflammation and range of motion of the joint has been restored, exercise can be instituted to rebuild muscular strength. At first isometric exercise with minimal joint motion is encouraged to stimulate the redevelopment of muscular strength without abrasion of the joint surfaces. As the disease becomes inactive more vigorous strengthening exercises may be given. Strengthening exercise to finger flexors is contraindicated since it promotes ulnar deviation which is sometimes accompanied by anterior subluxation of proximal phalanges.[24]

Exercise to Improve Chest Expansion.

Because of the involvement of costo-vertebral joints chest expansion is limited in the majority of children with rheumatoid arthritis. Appropriate exercise to maintain and to improve chest expansion should be carried out daily.

Functional Independence

Each person who is physically independent in self care must be able to perform more than 70 motor activities in the course of each day. These basic activities include rising from bed, caring for hygiene, eating, dressing, ambulating, climbing stairs, and performing a wide variety of manual tasks. Any person who cannot accomplish all of these activities will be dependent on others for help each day.[25,26] The lack of ability to carry out some of these tasks is common in arthritic children and if the general condition of the patient indicates that he may fail to perform any of the activities of daily living the ability to perform each of these activities should be tested. Activities that cannot be performed should be analyzed, proper exercise should be selected to increase the patient's ability, and these special techniques taught and practiced until he can perform them. An orthosis, wheelchair, crutch or cane may be necessary to make ambulation possible. A variety of assistive equipment such as utensils, feeders, holders and so on are available to facilitate the training and achievement of daily living.[27,28]

Medication

Aspirin

Aspirin is the drug of choice to diminish the inflammation and pain in rheumatoid arthritis. A blood salicylate level of 20 to 30 mg./100 ml. is necessary to achieve an effective clinical response.[29,30] Appropriate doses of aspirin should be given every four hours. One night dose can be skipped after the acute stage is over. Aspirin has been shown to exert an objectively demonstrable anti-inflammatory effect when given in adequate regular doses to patients with active rheumatoid disease.[31] Children tolerate higher (30 mg. or more) blood levels without salicylism, but should be carefully monitored for toxicity.[32] In salicylate intoxication infants show intense ketosis and acidosis whereas older children usually develop respiratory alkalosis.

Gold Salts

Gold therapy has been used in the treatment of rheumatoid arthritis for almost 50 years. Favorable results have been reported for the use of gold in juvenile rheumatoid arthritis.[33] An evaluation by the Cooperating Clinics Committee of the American Rheumatism Association[34] showed the children treated with gold presented fewer active joints, stronger grip strength and lower erythrocyte sedimentation rate when compared with the control patients at 3, 6, and 18 months. However, by 30 months there was little difference to be found between the two groups.

The dosage for children is 1 mg./kg./week for 20 weeks, and then every two to four weeks for two years thereafter, if there has been evidence for improvement.[33]

Other Medication

In the 1950's and the early 1960's corticosteroids had been considered miracle medications for the treatment of rheumatoid arthritis. However, accumulated experience has shown that corticosteroids provide only temporary suppression of the symptoms without affecting the course of the disease but have many serious side effects. Therefore, the use of corticosteroids has been gradually decreased. D-Penicillamine[35] and immunosuppressive therapy[36] are two of the more recent methods which have been tried with some success.

Surgery

In selected patients who have persistent or recurring synovitis for at least six months in spite of adequate medical treatment[37] synovectomy may be performed. Decrease in inflammatory reaction, swelling and pain as well as stopping or diminishing the joint damage are the goals which have been reported in many of these cases.[37–42] Other surgical procedures to diminish pain and deformity and improve function, such as arthrotomy, release of tight tendon and fascia, and osteotomy may also be used.[43,44] Procedures involving joints such as arthrodesis and arthroplasty should be delayed until the growing age is over.

Psychosocial

Intensive counseling and reassurance of patient and family are the first steps toward success in the management of juvenile rheumatoid arthritis. Restriction of the activities of a child with active rheumatoid arthritis or complete bedrest for long duration may be criticized since it may cause considerable psychological stress on the patient. But, psychological stress in these cases can be best prevented and treated with full recovery rather than allowing the child to be overactive during the active stage of the disease which may result in further joint damage, permanent disability and unhappiness. Education of the child should not be delayed because of the disease. The child may continue his education with a home-bound training program even in the active stage of the disease and thereafter go to school in a wheelchair if necessary. Vocational counseling and evaluation will also be important to select the appropriate job for patients who become disabled or whose disease shows progression.

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Arthrogryposis and Infantile Hypercalcemia Syndrome In Siblings

LEON SATRAN, M.D.*, and ROBERT O. FISCH, M.D.*

Arthrogryposis Multiplex Congenita and the Infantile Hypercalcemia Syndrome are described in siblings, an unusual occurrence. Each rare entity is briefly reviewed, emphasizing clinical presentation and etiologic possibilities. There may exist a related hereditary origin for both of these obscure conditions.

ARTHROGRYPOSIS MULTIPLEX Congenita and the Infantile Hypercalcemia Syndrome are well described clinical entities of obscure etiologies. This report describes the unusual occurrence of these conditions in siblings.

Case Reports

Case 1

A male infant was born to a healthy 29-year-old woman after an uncomplicated 42 week pregnancy. Unknown amounts of Vitamin D were taken throughout gestation. The birthweight was 2950 grams. He fed poorly at the breast and was generally irritable. Development was delayed in that he smiled at four months, sat up at one year, walked at two and a half years, and did not use single words until after two years. Bilateral inguinal hernias were repaired at three days of age. A systolic heart murmur was heard at two months. At 8 months, resistance of the hips to abduction was noted and thought to be secondary to muscle spasm. He was considered to have spastic diplegia because of symmetrical hyperreflexia and sustained clonus of both lower extremities. Cardiac studies including right heart catheterization and retrograde aortogram showed valvular and peripheral pulmonic stenosis and supravalvular aortic narrowing. His serum calcium at seven months was 11.6 mg%. At that time the diagnosis of infantile hypercalcemia was made. The calcium level returned to normal with no specific treatment. The infant suffered repeated infections in his first year with multiple bouts of diarrhea. At five years, his weight was 16 kg and height 101 cm, both in the tenth percentile for his age. His facial features were coarse, with full cheeks, broad forehead, prominent ears, epicanthal folds, broad upper lip and small mandible (Figure 1). A grade III/VI systolic ejection murmur was heard along both sternal borders. The testes were undescended. Hyperreflexia persisted in both lower extremities. Chest Xray showed poststenotic dilatation of the pulmonary artery and prominence of the aortic arch. Psychometric evaluation placed him in the lower range of mild mental retardation with an IQ score of 56 on the Stanford-Binet scale. Currently, he is nine years old and is in a special school for physically handicapped children.

Case 2

This female infant was born at term following a normal pregnancy to the 34-year-old mother of the patient described in Case 1. Birthweight was 3,340 grams. Gross deformities of all extremities were obvious in the newborn exam. These included: multiple bilateral joint contractures of the shoulders, elbows, wrists, knees, and ankles. There was absence of normal skin creases at these joints. (Figure 2). Muscle mass was markedly diminished in all limbs. Xrays showed severe clubbed deformities of hands and feet. Eleven ribs were present bilaterally. The left hip was dysplastic with lateral displacement of the femoral head. Based on these findings, the

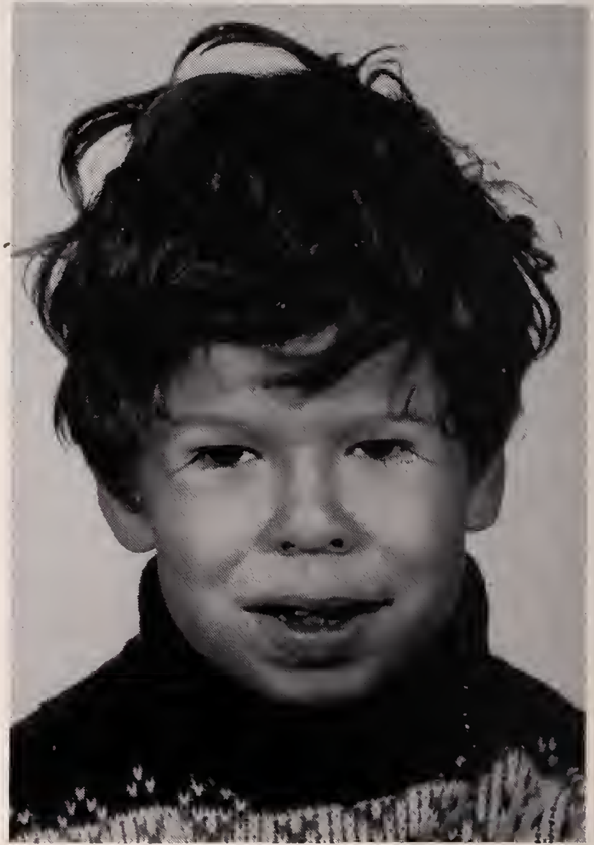

Fig. 1—Patient described in Case 1 with diagnosis of infantile hypercalcemia syndrome at five years of age. (By permission)

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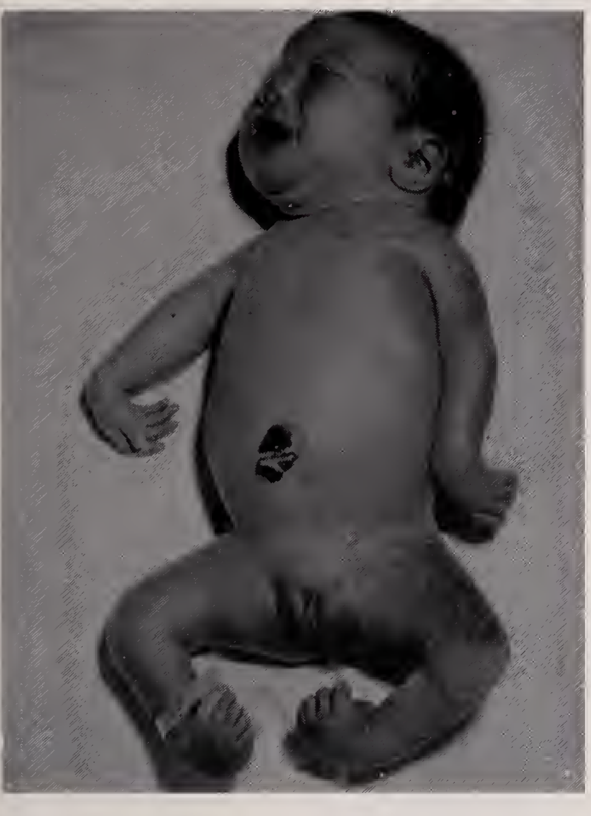

Fig. 2—Patient described in Case 2 with arthrogryposis multiplex congenita, shortly after birth. (By permission)

diagnosis of Arthrogryposis multiplex congenita was made. Electromyography showed no evidence of muscle denervation or fibrillation. Serologic studies for viral agents were negative except for Rubella hemagglutination — inhibition titer of 1:32 which was thought to be the result of transferred maternal antibody. Chromosomal analysis was normal. Bilateral foot casts were placed, and since birth there have been numerous cast changes in all extremities. She is currently four and a half years old, wears leg braces and has normal intelligence.

Family Background

The mother is 34-years-old and has been in good health all her life. Her family history is non-contributory. There was no consanguinity. The father is 36 years old and in good health. Except for a nephew with cystic fibrosis, there is no hereditary or congenital disease in his family. There are two normal siblings, a girl age 13 and a boy, 11.

Discussion

The infantile hypercalcemia syndrome was first described in detail in reports from Great Britain and Switzerland in 1952 when Fanconi et al. drew attention to infants with unexplained hypercalcemia.[1] These patients had a similar facial appearance, later described by Williams as a syndrome which now bears his name.[2] There are several distinguishing features of this widely reviewed entity, [3,4] probably the least of which is an elevation in the serum calcium level. These include short stature, lower than normal birthweight, and moderate to severe mental retardation. The typical face has a broad maxilla, small mandible, open mouth, prominent upper lip and ears, upturned small nose, and full pouting cheeks. The forehead is usually broad. Hypertelorism, epicanthal folds, and strabismus are often present. Cardiovascular abnormalities usually consist of supravalvular aortic stenosis or hypoplasia, with or without peripheral pulmonic stenosis. A variety of other cardiac abnormalities may also be present.[4] Osteosclerosis is usually evident at the base of the skull and metaphyses. Dental abnormalities, including hypoplasia of enamel and malocclusion are common. The voice is often quite hoarse. Elevated serum calcium is usually found in the first eight to 18 months which may be associated with hypotonia, constipation, anorexia, vomiting, polyuria, polydypsia, renal insufficiency, and transient facial palsy. Inguinal hernias and spinal abnormalities are often present. The serum cholesterol may be elevated.[5] The most serious complications of the so-called severe form[3] are renal insufficiency with nephrocalcinosis and osteosclerosis. While the serum calcium is almost always elevated in the very young patient, it is likely to be normal in older children. When the child is in the normocalcemic stage, the diagnosis becomes more subjective and depends on recognition of the other typical features.[4,6] Similar cardiovascular lesions have been observed in animals on high doses of vitamin D.[7] It is not known whether the pathology is produced by vitamin D or the hypercalcemia which ensues. The characteristic physical features may be secondary to an unusual sensitivity of the individual to vitamin D. The occurrence of this syndrome is usually sporadic and the incidence, rare.[3] A recent case report by Méhes, et al. reviews the controversial evidence for any true hereditary pattern and suggests a possible dominant mode of transmission.[8] Treatment for the hypercalcemia includes reduction or elimination of dietary vitamin D and avoidance of sunlight. A diet of only minimal calcium should be provided until the serum values are normal for an approximate nine-month period after which gradual increases in calcium, vitamin D, and sunlight may be permitted.[3] Oral cortisone administration may be helpful in rapidly reducing the serum calcium.[9] Surgical correction of cardiovascular anomalies should be considered when clinically indicated. Special education is necessary for these patients because of associated mental retardation.

Arthrogryposis multiplex congenita is a rare, poorly understood clinical entity consisting of multiple joint contractures present at birth and was first described by Otto in 1841.[10] Rocher suggested the name "multiple congenital articular rigidities"[11] and proposed intrauterine pressure as a possible etiology, which by restricting fetal movement would cause secondary joint contractures. Stern in 1923[12] was the first to use the term arthrogryposis multiplex congenita which is derived from two Greek words meaning crooking of joints. Affected joints may be fixed in flexion or extension. Severe club feet deformities are nearly always present. Associated hip dislocations and scoliosis are frequent. Distal extremities are more severely involved. Sensation is usually not affected. The skin is usually tense with a glossy appearance, especially in the fingers. Subcutaneous tissue is sparse with little fat present. Two major categories are generally described from a pathophysiologic viewpoint: those due to degeneration and loss of anterior horn cells in the spinal cord which appear to be more common,[13] and a myopathic variety, thought to represent an infantile type of muscular dystrophy.[14] Others feel that arthrogryposis may result from lack of intrauterine movement for any reason,[15] and its reported occurrence following treatment of maternal tetanus with muscle relaxants[16] would tend to support this idea. High birth order, elevated paternal age, and a suggested high incidence of fetal wastage in other pregnancies of mothers of affected infants have been noted by Fisher, et al.[17] Although the incidence is generally sporadic, several familial cases have been described. Lebenthal and co-workers described the myopathic variety in 23 cases of an Arab kindred. This suggests that the myopathic variety is inherited as an autosomal recessive trait, in contrast to the neurogenic type which has been observed to occur in a dominant mode.[18] Research has failed to show any consistent pattern of genetic transmission. A review of familial cases by Pedreira and Long emphasized widely differing opinions regarding site of involvement, spectrum of associated anomalies, and postulated links with other neurologic problems.[19] For these reasons the authors felt that arthrogryposis is present in many syndromes of varying etiologies and that any strict classification should not be used. Intelligence is usually normal in these patients. The prognosis, therefore, is related to the severity of involvement and the aggressiveness of treatment. Habilitation, surgical alleviation of deformities, and physical and occupational therapy all help the child to function more normally. It is noteworthy that six of the 23 patients with arthrogryposis described by Lebenthal had associated congenital heart disease. Of these, 2 had aortic stenosis, and a third, coarctation of the aorta.[18] Friedman in 1965 also reported a patient with arthrogryposis and congenital aortic stenosis.[20]

The occurrence of these cases in siblings is unusual and to our knowledge has not been previously documented. Arthrogryposis and infantile hypercalcemia have both been described as being hereditary. Although no true pattern of transmission has been established for either entity, reports of patients with arthrogryposis having cardiac abnormalities seen in infantile hypercalcemia[18,20] suggest that they are related chromosomal abnormalities.

References

1 Fanconi G. Giradet. P. Schlesinger. B. Butler. N. and Black. J. Chronische hypercalcamie. kombiniert mit osteosklerose. hyperazotamic. minderwuchs and kongenitalen misbildungen. Helv Paed Acta 4:314. 1952.
2 Williams. JCP. Barratt-Boyes. BG. and Lowe. JB. Supravalvular aortic stenosis. Circulation 24:1311. 1961.
3. Fraser. D. Kidd, BSL. Kooh. SW and Paunier. L: A new look at infantile hypercalcemia. Pediatr Clin N Amer 13:503. 1966.
4 Dupont. B. Dupont, A. Bliddal. J. Holst. E. Melchior. JC. and Ottesen. OE: Idiopathic hypercalcemia of infancy. the elfin face syndrome. Danish Med Bull 17: 2:33. 1970.
5. Forfar. JO. Tompsett, SL. and Forshall. WW: Biochemical studies in idiopathic hypercalcemia of infancy Arch Dis Child 34:525. 1959
6. Jones. KL. and Smith. DW. The Williams elfin facies syndrome. a new perspective. J Pediatr 86:718. 1975
7. Friedman. WF. and Roberts. WC. The experimental relationship between vitamin D and supravalvular aortic stenosis. J Pediatr 69:929. 1966.
8. Méhes. K. Szehd. ZS. and Toth. P: Possible dominant inheritance of the idiopathic hypercalcemic syndrome. Hum Hered 25:30. 1975.
9. Mitchell. RG: The prognosis of idiopathic hypercalcemia of infants. Arch Dis Child 35:383. 1960.
10. Otto. cited by Rosenkranz. E: Ueber kongenitale kontrakturen der oberen extremitaten. Ztschr Orthop Chir 14:52. 1905.
11 Rocher. HL: Les raideurs articulaires congenitales multiplex J Med Bordeaux 43:772. 1931
12. Stern. WG. Arthrogryposis multiplex congenita. JAMA 81:1507. 1923.
13. Drachman. DB and Banker. BQ. Arthrogryposis multiplex congenita. Case due to disease of the anterior horn cells. Arch Neurol 5:77. 1961.
14. Banker. BQ. Victor. M. and Adams. R Arthrogryposis multiplex congenita due to congenital muscular dystrophy. Brain 80:319. 1957.
15. Badgely. CE: Correlation of clinical and anatomical facts leading to a conception of the etiology of congenital hip dysplasias J Bone and Joint Surg 25:503. 1943
16. Jago. RH: Arthrogryposis following treatment of maternal tetanus with muscle relaxants Arch Dis Child 45:277. 1970.
17. Fisher. RL. Johnstone. WT. Fisher. WH. and Goldkamp. OG: Arthrogryposis multiplex congenita A clinical investigation. J Pediatr 76:255. 1970.
18. Lebenthal. E. Shochet. SB. Adam. A Seelenfreund. M. Fried. A. Najenson. T. Sandbank. U. and Matoth. Y: Arthrogryposis multiplex congenita: Twenty-Three cases in an Arah kindred. Pediatr 46.891. 1970.
19. Pedreira. FA. and Long. RE: Arthrogryposis multiplex congenita in one of identical twins Amer J Dis Child 121. 64. 1971.
20 Friedman. WF. Mason. DT. and Braunwald. E: Arthrogryposis multiplex congenita associated with congenital aortic stenosis. J Pediatr 67:682. 1965.

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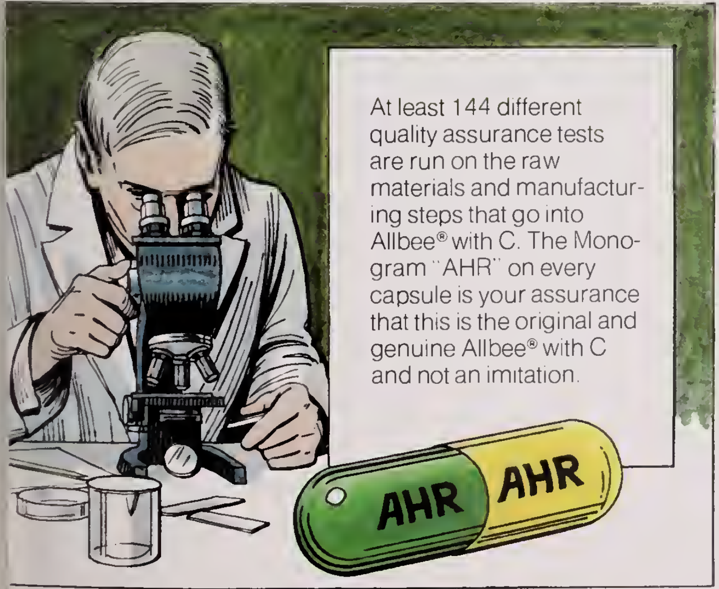

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An Interview with Dr. Chester A. Anderson

President of the Minnesota State Medical Association

Interviewer: *Dr. Anderson, you are newly elected as President of the Minnesota State Medical Association. Yet you are not new to the Association. Could you tell us about your past with the Association?*

Dr. Chester A. Anderson:

My past with the Association goes back to the mid-60s when I was elected a delegate from Renville-Redwood County Medical Society. I served for four years. Then I was inactive until 1971 when I was asked by the Council of the State Medical Association to accept responsibility of being chairman of the then called "Public Policy" Committee of the State Association. My major responsibility was to see that legislation conceived by the House of Delegates for the Council was carried to the Capitol. I tried to put it into law one way or another. At the same time, my responsibility as chairman of the Public Policy Committee was to alleviate laws that would not benefit health care of Minnesota citizens. I have had access to all Council meetings in my capacity as Chairman of that committee, and the Executive Committee as well.

Interviewer: *Dr. Anderson, you are known as the Association's Man at the State Legislature. I understand you have been excellent. Could you give us a few clues on how to deal with the Legislature?*

Dr. Anderson:

I think that each new Legislature is a new body with new rules, new regulations, and new ideas. You have to approach legislators on that basis. To be successful with Legislators, you have to consider them as individuals, just as you and I are individuals. For the most part, these people are as interested in their constituents as we are in our patients. The constituents and our patients are the same people, and if one continually keeps that in mind, you are going to have a meeting of the minds with legislators. I deeply respect all legislators. I certainly do not agree with them all of the time, but they will sit down and listen to you if you maintain your credibility. The problem of organized medicine through the years has been to maintain credibility with legislators.

Some of the ways you can do this are to know your facts and to go into any legislative committee meeting completely prepared on what you are talking about. Don't go with your hat in hand. Go with rules, regulations, facts, papers, so they fully believe you know what you are talking about. That is number one.

Number two, I think you have to develop a personal relationship with legislators, not just in the legislative session, but when these people are not in session. Get to know them personally,

know what their likes are, what their dislikes are, and then try to understand their viewpoint.

They are not always going to think like you think, but certainly they will listen to you if you don't become abusive; act like a gentleman; and don't try to push. The worst thing you can do, in any legislative session is be pushy.

You have to take your time because the entire legislative process is a time-consuming process. All too often all of us feel this process is slow, burdensome, cumbersome, which it is, but you really are protected by that mechanism. If you understand this, you just bide your time, do the best job you can, contact your legislators often for short periods of time, and most of the time you can succeed.

Interviewer: *Many physicians are apprehensive because most legislators are democrats. You are saying, if you approach these legislators as individuals, rather than as hostile members of the dominant political party, you have a reasonable chance of achieving success.*

Dr. Anderson:

I think you have to do that. I certainly am a Conservative, and I am certainly not known as a member of the dominant party in the State these days. In fact, my political life has been on the other side of the aisle. But when you are dealing with health legislation, with legislators, you are dealing with people who have an interest in people.

When you do that, you are not talking about party lines at all. We have people on both sides of the aisle who fully agree with us, and sometimes we have people whom we think should be with us on the other side of the voting mechanism. It is an individual thing, and if one considers it that way, I think you can make progress.

Secondly, most legislative work is done in committees, committee chairmen, committee members, and you put in most of your time getting to know the committeepersons, committee chairmen, and you can accomplish a great deal if you get to know these people personally.

Interviewer: *Speaking of your conservative leanings, last year you introduced Senator John Tower of Texas, who is known to be conservative, at the Association's first Socio-Economic Conference. Was that conference a success, and do you plan to repeat it?*

Dr. Anderson:

That conference, in my estimation, was a marked success, and yes, we do plan to repeat it. I think the conference was successful in two ways: (1) it brought physicians together at a meeting where they could exchange views about the health care problems, bureaucracy, and the inroads of government officials into the practice of medicine, and (2) it made the public aware that physicians recognize there are problems in health care delivery, and physicians are trying to do something about it.

This is one of the problems we have in medicine, communicating to

the public, not only as physicians but as citizens as well. We have the same problems as citizens as they do, and we have to let them know that.

Interviewer: *Do you feel there is now less apathy among physicians about political matters?*

Dr. Anderson:

There is less apathy, but still not enough activity by physicians in politics. The way to be successful in politics and legislation is to elect people to office who already have the same feelings, the same attitudes, the same philosophy that you do.

If they are in office, then you really don't have any problems; you don't have to persuade them. They already feel as you do.

So if you are really going to be successful legislatively, the answer is to get out and work in the political arena which means get into active politics, get into campaign search committees for candidates, support candidates, not only financially, which most physicians will do partially, but with personal time as well. A candidate who wins and knows that you have been out there pushing doorbells, delivering pamphlets, sealing stamps, is going to listen to you if he is elected and gets on the hill.

Interviewer: *There is a great deal of talk about reorganization within the State Medical Association. What do you think this talk means to the physician at the grassroot level? How should he feel about this?*

Dr. Anderson:

I basically feel we have a long way to go, even informing our own membership as to what the State Organization is doing for it, and what the AMA is doing for it. You hear repeatedly in doctor dressing rooms, staff meetings, "what are they doing for me?" The reorganization within the State itself is going to be helpful. The new Division of Socio-Economics is geared towards keeping physicians informed on what socio-economic problems are, what the organization is doing for them, and in turn, what government is trying to do for and to them. Most physicians are now aware that government is spreading its tentacles into every phase of medical practice.

Because of the reorganization in the State Office itself, physicians are going to have more contact with staff people, they are going to understand more what the State Office is trying to do for them, and I can see only an upward progression of the membership's satisfaction with the State Organization.

Interviewer: *The State Association has formed a Health Care Cost Containment Commission. Is this Commission new to Minnesota? What are your hopes for this Commission?*

Dr. Anderson:

It is new in Minnesota. It is not new nationally. The AMA has such a commission which has been in operation for better than a year, and they are supposed to bring their findings to the AMA Board of Directors come January of 1978. So nationally, no; statewide, yes.

Every state has the same problem, I am sure, as far as health care costs are concerned. We are just hoping via this Commission to find answers to try to keep down the ever escalating cost of health care and medical care.

This Commission is made up of 21 people, including business people, labor people, hospital administrators, physicians, government officials. We hope we have a good cross-section of all the people involved in health care and in health care costs.

What the final results of this Commission will be, I don't know. I sincerely hope that they will be something that reduces health care costs. I do not know. I am not pessimistic, and I guess I have to say I am not optimistic either.

Interviewer: *Could you tell us about your background; where you were born; where you were educated; and where you practice?*

Dr. Anderson:

I am a small town boy at heart. I was born in Howard Lake, Minnesota, a small town about fifty miles west of the Twin Cities. I grew up and finished highschool in Cokato, Minnesota, which is in that same area. I attended Macalester College in St. Paul, for four years, got my B.A. there. While there I played a little football. I attended Macalester because it had a reputation for getting pre-med students into the University of Minnesota Medical School.

I can remember when I was back in eighth grade wanting to be a doctor, and I have not changed since. I was fortunate enough to get into the University of Minnesota medical school, and then I interned at Miller Hospital in St. Paul. From there I put in two years in the medical corps of the Army, and came out and went right into Family Practice.

Interviewer: *What year was that?*

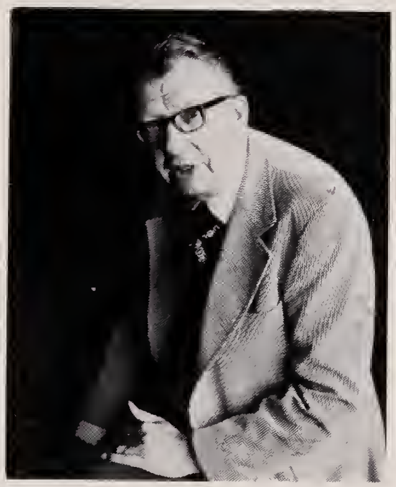
Dr. Anderson:

1947. I went out to a little town called Winsted, Minnesota, for a year and a half, and moved to Hector, where I am still situated. I have been there for 29 years.

Interviewer: *I don't want to hector you, but could you tell us a little about Hector?*

Dr. Anderson:

Hector is a small, rural community of about 1400 people, out in west central Minnesota. It is rich farming country. Hector's citizens are practically all farmers, and Hector exists only to provide services to the surrounding farm people. We have an excellent school system. We have an outdoor community swimming pool. We have three golf courses within an area of 10-12 miles. Hector is a nice place to raise children, and a nice place to work. I enjoy my practice there, and I enjoy the people I take care of.



Interviewer: *I am sure the people in Hector enjoy you too, and are proud you are President of the Association. In that capacity, what are your goals?*

Dr. Anderson:

My goals? My number one goal, very frankly, is increasing communications between physicians and the public. I think that has been too long neglected, and I would sincerely hope with our hiring of Jim Kosmo and more emphasis on socio-economic division goals, that we can begin to communicate better with patients.

You know, most patients say their own individual doctors are swell guys, but when they put that physician with a group and call it organized medicine, then they are not nice people any more.

We have to get back to the old idea that the physician will take time with his patients, talk to them, reason with them, and make them feel that they are the most important individuals in the world.

If we can do that, just remember that in our daily work, then we would solve a lot of problems that organized medicine has today.

Communications is one . . .

Reorganization, we have already touched on . . . I want to see this reorganization go even further, into health service areas, into health service agencies. The House has directed that an Ad Hoc Committee be chosen to study the whole possibility of reorganizing the State Medical Association according to health service areas. That, I think, is going to have to take priority.

Another priority is setting up a risk management program for the membership so members can learn to avoid malpractice problems. A risk management program out to the doctor's office can help doctors be a little more careful in avoiding situations that may lead to malpractice suits.

Interviewer: *What do you mean by risk management programs? Do you mean programs to minimize the risk of malpractice suits?*

Dr. Anderson:

That is exactly correct. In other words, why do people sue physicians? Why do they bring about a suit against a doctor whom they have originally had confidence in? What is the mechanism that brings this on?

All too often, it is not the care involved. It is the improper word used by the physician, or the improper attitude of the office help. It is a personal dissatisfaction, not necessarily with the care. How those people were handled. I think physicians have to be taught this. They have to be taught how to be careful about properly handling people.

Interviewer: *I would like to return to something you said earlier. You said patients like physicians privately, but not collectively. How can we bring about collective approval? . . . Through the press? Outside the press? Through a public relations man?*

Dr. Anderson:

I think a PR man is essential. The best PR is still the one-on-one basis between physician and patient. Each individual has to be his own PR man. A physician is both a scientist and an artist. The science and art of medicine are completely interrelative, and you can't separate one from the other. You have excellent technicians, excellent scientists in medicine, and yet these people have a difficult time building up a practice. Vice versa. We have mediocre scientists with tremendous practices. Why? It is the old story again of knowing the art of medicine. When you can coordinate the two and put them together in that same individual, you have an efficient, active, operating physician. That is what we have to be taught, and they don't teach that in medical school.

Interviewer: *You think medical schools should teach the Art of Medicine?*

Dr. Anderson:

Yes, I do. I also think they should teach a little about promoting a better image; they should teach a little about how you should communicate to your patient what you are trying to get across to them and tell them. If they don't do that, then it is up to the State Association to do it.

Interviewer: *Should medical schools teach more about office management?*

Dr. Anderson:

There should be a course in office management. We are all businessmen. If we don't operate a decent business, we don't stay in business very long. Medical practice is a business. The old idea of the country doctor with a black bag and a team of horses and that is all you need . . . is past history. It is long gone.

I operate a business. I have employees in my office, and if the cash flow isn't there to pay the bills, you don't continue to operate. Yet at the same time, I would hesitate to have my patients feel that I am just a businessman. When they feel that way, I think I have lost what I am trying to do. At the same time, you can't ignore it. You can't forget it. It has to be done.

That is really not what I am talking about. What I am talking about is relating to the people, relating to the patients you are taking care of so that they feel when they come into your office, they are the most important thing we are thinking about right now. Our mind is completely on them, on trying to do what is best for them. If we can make them feel that way, and continue to feel that way, then they are going to be satisfied with what we are doing for them.

Interviewer: *So you are saying that the Association should offer formalized programs to teach physicians to minimize malpractice suits, to manage patients as customers, and to deal with them as individuals?*

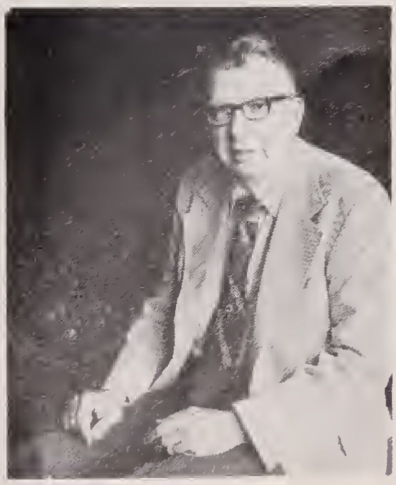
Dr. Anderson:

Yes. If you make your patients feel you are doing the utmost for them, you have done everything you can possibly do and have done it well, scientifically, and communicate to them that you have done this, a lot of the other problems related to organized medicine will disappear. That is why these problems have come up. The old adage that a friend seldom will sue you, is true. If you can make your patient feel you are not only his/her doctor, but a friend, you are going to have fewer law suits. That is a matter of communications. You have to be able to communicate.

Interviewer: *Times are changing rapidly. Especially in the relationships between the medical profession and the public. And not all for the good. You want to make changes to improve the way the public feels about organized medicine. Are you optimistic?*

Dr. Anderson:

I am optimistic. You know public polls still come through with the statement that physicians are probably the most respected profession in the country today. All public polls pretty well support that. Politicians are down near used car dealers as far as respect of the



public is concerned. Yet, we can't lose track of the fact that politicians are the people who are going to govern how we practice medicine. They have the assets, fortunately or unfortunately, of government tax money behind them to go ahead and do this. If organized medicine thinks for a minute that they can raise enough money to counteract all government proposals on a staff-by-staff basis, they just can't possibly do it.

It gets down to the nitty-gritty of individual physician talking to the individual patient telling that patient what the physician thinks is the best thing for him as far as health care goes. We who have been brought up, particularly in my era, feel that the private practice of medicine is still the best mechanism, providing the best care to most people.

Interviewer: *I was recently reading the hearings of the Government Wage and Price Stability Commission*. The Commission interviewed people from major cities around the country last year. These government officials concluded a national health insurance is by no means inevitable. As we get closer and closer, the cost of grafting a federal program on the present system is more and more formidable. So there is a real opportunity at this point for the private sector to make fundamental changes to fend off a national program. Is that an overreading on my part?*

Dr. Anderson:

No, that is absolutely correct. Medicine all too often has been reacting rather than acting. The whole idea of our socio-economic division is to act rather than react. In other words, come forth with new ideas, new mechanisms of delivering health care, and at the same time providing quality care. If you can do that and do it privately, I think in our economic system, people are going to buy that much better than they are going to buy government medicine. Everything the government does, no matter how you cut it, costs more money, increases bureaucracy, is inefficient, less organized. I think the general public feels this way.

Interviewer: *At the same time, these Wage and Price stability hearings point out that even though the private sector reduces costs, things will change. For example, we may have to give a little on usual and customary fees and negotiate fees. Also, we may have to negotiate as a group with larger organizations, and it may not be the one-on-one situation we have always cherished in the past.*

Dr. Anderson:

You are right. We are getting more groups together, and bargaining for better care at less money. Yet at the same time, anything you pay for, generally speaking in this country, you get quality depending on price. You are not going to guarantee quality, as Califano was literally trying to say out in San Francisco, at a lower price. It has never been accomplished in the marketplace and it will not be accomplished in the medical practice either.

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*Council on Wage and Price Stability. Rising Health Care Costs. Washington, D.C., December 1976.

Interviewer: *So you regard the private market mechanism as more effective and appropriate than government regulations?*

Dr. Anderson:

I think so. But we have to be sensitive to social problems. One problem we are having in medicine is finding access to health care for minority groups who can't afford to pay. Unfortunately, this has been overemphasized by government as a mechanism to promote national health insurance. When you get down to statistics, you find that only 3-5% of the total population ever made a comment they have difficulty getting into the medical arena for medical care. Ninety-five percent of the people have no problem. Should you change the entire mechanism of health care provision because of 3 or 5%? My answer is no. The medical profession should shift its priorities and say; all right let's go after these people and figure out how we can get them into the mainstream of medical care. Then the government will have less to say about the need for health care insurance. Medicine has to do that.

Interviewer: *So organized medicine should take the initiative and serve the medically underserved?*

Dr. Anderson:

Yes.

Interviewer: Dr. Richard L. Reece
Photographer: Dr. Farrell Stiegler

Cover Painting

"Salt Jar"

Dr. Robert Knutson, St. Paul anesthesiologist, told the editors that the cover photo shows the technique by which the painting shown was done. This is called the "sight-size" technique which has a tradition dating back to the Renaissance. In this technique the still life (or portrait subject) is placed next to the canvas. The painter stands back at a distance three times the greatest measurement of the subject. (In the case of a standing man, for example, the painter stands back about 18 feet.) With a ruler the painter grids across from object to canvas, making his measurements on the canvas equal to that of the object. Plumb bobs are also used to grid in a vertical plane.

The subject is also viewed with a "black mirror" which washes out colors, but allows the painter to see correct values (lights and darks).

For those interested, the technique is described in American Artist, December, 1970, and is taught in an art school in Minneapolis, the Atelier Lack, above the Rainbow Cafe on Lake Street and Hennepin Avenue.

Continuing Medical Education

Southern Minnesota Medical Association
September 17th, 1977
Judd Hall Rochester, Minnesota

8:15 A.M.	Registration	

Program

9:00 A.M.	Current Update on Prostate Cancer	Robert P. Myers, M.D. Rochester
9:20 A.M.	"Knee Pain" — Is it a Slip?	Elmer W. Lippmann, Jr. M.D. Mankato
9:40 A.M.	Polycentric Knee Arthroplasty Revisited: A five year follow-up.	Lowell F. A. Peterson, M.D. Rochester
10:00 A.M.	INTERMISSION	
10:20 A.M.	Colo-vesical Fistula: Revisited 1977	Frederick D. Nemer, M.D. & Stanley M. Goldberg, M.D. Minneapolis
10:40 A.M.	The Surgical Treatment of Peptic Ulcer	Donald W. Hannon, M.D. St. Paul
11:00 A.M.	Medical Treatment of Duodenal Ulcer with Cimetidine	Alan Cameron, M.D. Rochester
11:10 A.M.	Echo Cardiography — Current Status	Abduhl Tajik, M.D. Rochester
	Diagnostic Nuclear Medicine & Ultrasound: Application to the Community Hospital & Outpatient Clinic	D. K. Ohrt, M.D. Mankato
	C. A. T. Scanning of the Body — Current Status	John Muhm, M.D. Rochester
12:00 NOON	Luncheon & Business Meeting	
1:30 P.M.	Primary Amenorrhea — An Unusual Cause	Michael A. Howard, M.D. Mankato
1:40 P.M.	The Surgical Management of Ventricular Aneurysm	William D. Kelly, M.D. Minneapolis
2:00 P.M.	"Salvaging the Ischemic Limb."	Richard C. Lillehei, M.D. Minneapolis
2:20 P.M.	The Diagnosis, Treatment and Follow-Up of Trophoblastic Disease	Steven D. Penkhus, M.D. & J. B. Crespo, M.D. Mankato
2:40 P.M.	Clinical Pathological Correlation of some common Orthopaedic complaints.	R. Wynn Kearney, Jr. M.D. & D. K. Ohrt, M.D. Mankato
3:00 P.M.	Hemophiluc Septicemia and Meningitis	Lowell W. Barr, M.D. Albert Lea
3:30 P.M.	Estate Planning for the Physician and his Wife Mr. John R. Wicks, Dorsey Law Firm JOINT MEETING WITH THE LADIES	Rochester

6 Prescribed Hours of Credit have been requested

Editorials

Reactions to Gamma Globulin

GAMMA GLOBULIN administration can be associated with adverse reactions, and the article by Bruhl in this issue of *Minnesota Medicine** reminds physicians of this possibility. Bruhl reports a high incidence of reactions to gamma globulin — 25% of those receiving 10 cc. The majority of his patients had fever, local reactions, gastrointestinal symptoms, and malaise, headaches, and aching.

Bruhl suggests that the reactions he describes are hypersensitivity or allergic reactions. It is worthwhile to consider possible immunologic mechanisms that might be playing a role in these reactions. Hypersensitivity reactions can be classified as being of four types[1]. The clinical hallmarks of type I (IgE-mediated reactions), such as urticaria, angioedema, wheezing, anaphylaxis, and eosinophilia, were lacking in Bruhl's patients, although large local reactions can be manifestations of IgE-mediated reactions. Likewise, clinical manifestations of type III reactions (antigen-antibody complex or Arthus-type reactions) such as arthritis, rash, lymphadenopathy, or renal disease were not present. Whether type II (cytotoxic) or type IV (delayed or tuberculin-type reactions) played a role is unknown. Could these patients have developed antibodies to aggregated IgG or Gm determinants? The mechanism of drug fever is unknown. However, most patients with drug fever feel well despite a high temperature, unlike Bruhl's patients, who were quite ill. Gamma globulin aggregates are present in commercial gamma globulin. Intravenous injection of gamma globulin results in a high incidence of anaphylactic-like immediate reactions presumably due to the aggregates. The mechanism of this reaction likely involves a nonantibody-mediated release of mediators. Gamma globulin should be given intramuscularly, but intravenous injection can occur inadvertently and result in such a reaction. None of Bruhl's patients had this type of reaction.

Bruhl did not do extensive investigation of his patients, and this would need to be done to clarify the mechanism involved. Although the mechanism of these reactions remains unknown, physicians should be aware of their occurrence. Gamma globulin, like all drugs, should be administered only when definite indications for its administration are present.

Richard G. Van Dellen, M.D.†
Rochester, Minnesota

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†Mayo Clinic and Mayo Foundation

*See page 673.

Reference

1. Patterson R, Zeiss CR, Kelly JF: Classification of hypersensitivity reactions (editorial). N Engl J Med 295:277, 1976

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0.5 Gm tablets

Rheumatoid Arthritis in Children

Doctors Ozel and Kottke* are to be congratulated for their fine article on "Rheumatoid Arthritis in Children" and for "putting it all together." Since most pediatric clinicians are mainly concerned with the diagnosis and management with drugs, they have failed to bring into the arena a discipline which has a great deal to offer the patient in the acute phase as well as the chronic phase. Nearly all children with rheumatoid arthritis would be far better off if The Physical Medicine Department was consulted immediately at the onset rather than after the joint has been permanently damaged. Too many of us have failed to use the helpful resources which are readily available.

C. Robbie Green, M.D.
Edina, Minnesota

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*See page 637.

Hypertension in Children

Until relatively recently, hypertension in children had not received much attention. It was thought to be rare and when present, it was generally considered to be secondary to renovascular or other disorders.[1-4] There were several reasons for these beliefs, the most important being that physicians frequently did not obtain blood pressures in children. Ranges of normal were not established and, consequently, there was disagreement regarding the level at which blood pressure was to be considered definitely abnormal.

Several recent studies in which routine blood pressures were determined in large numbers of children have helped establish the range of normal blood pressure in children, especially between the ages of four and 18 years.[5-9] The accompanying table (taken from a report of the Committee on Arteriosclerosis and Hypertension in Childhood, Council on Cardiovascular Disease in the Young, and the American Heart Association)[10] gives the 50th and 90th percentile pressures obtained by averaging the results of three studies.[5,7,8] The timely article on "Blood Pressure in Children" by Drs. Love and Moller, in this issue of the journal,* discusses the methods of determining blood pressure and ranges of supine blood pressure obtained by Dr. Londe in boys and girls ages four to 15 years.[5] These and other studies have shown that hypertension in children is not rare. The prevalence rate, in fact, is quite high, having been reported in 1-11% of children depending on the age of the child and the level of blood pressure considered 'hypertensive' by the author.[9,11-15] Some authors have regarded pressure readings above the 95th percentile for the age to be abnormal[15] while others have considered supine diastolic pressures of 90 mm. or higher to be definitely hypertensive.[12,16] More black and athletic males were found to be hypertensive than white[9,17] and more boys than girls.[13] The average prevalence of hypertension in adolescent children is probably of the order of 2-5% as compared to 20% in the adult population.

Follow-up studies have shown that about two-thirds of the children with high blood pressure readings continue to have persistent hypertension, whereas, in the remaining third, the blood pressure returns to normal on repeated testing.[13,18-20]

One of the most important and far-reaching advances in our knowledge of hypertension in children has been the recent recognition that a high percentage of children with hypertension have primary (or essential) rather than secondary hypertension, particularly in the adolescent age group.[4,15,16,21-23] Long-term studies by Loggie in Cincinnati have shown an increasing percentage of primary hypertension from 20% in 1969[4] to 55% in 1975.[16] In the series of Londe et al, 95% of the children seemed to have primary hypertension.[18] One of the reasons for this apparent

TABLE
Percentile Values for Blood Pressure by Age

	Systolic Pressure		Diastolic Pressure	
Age	50%	95%	50%	95%
0 to 6 mo.	80	110	45	60
3 yr.	95	112	64	80
5 yr.	97	115	65	84
10 yr.	110	130	70	92
15 yr.	116	138	70	95

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*See page 631.

MAY 11-12

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7	8	9	10	11 MSMA ANNUAL MEETING	12	1 Fishin' Season Opens
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21	22	23	24	25	26	27
28	29	30	31			

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increase in the number of children with primary hypertension is the more frequent screening of blood pressure in asymptomatic adolescents.[5,17,18,23]

Adolescents with mild asymptomatic hypertension, a negative physical examination, and a strong family history of hypertension are more likely to have primary hypertension. Primary hypertension is more common in black adolescent boys and girls.[16,23] A significant familial aggregation suggesting a genetic influence has been found in children with hypertension.[7] It is possible that factors responsible for essential or primary hypertension are acquired in childhood. A positive correlation with obesity,[12,15] smoking, and hyperlipedemia[12] has also been found. Secondary hypertension is more likely in children under 10 years of age, white adolescent girls, and those with diastolic pressures over 110 mm. of mercury. The causes of secondary hypertension and their work-up have been discussed in the article by Love and Moller and in standard pediatric texts.[24,25] All children with severe symptomatic and/or secondary hypertension should have a thorough investigative evaluation and appropriate treatment. However, it is doubtful whether such a full-scale investigation is warranted in children with mild asymptomatic hypertension.[16,18] These children should have a complete physical examination with repeated blood pressure determinations. A detailed family history regarding hypertension and cardiovascular disease should be obtained. A limited work-up including routine blood count, urinalysis, serum Na, K, C1, CO_2, BUN, creatinine clearance, chest Xray, and EEG should be done. If these are all normal, the patient should be followed with assessment of blood pressure and complete physical examination at regular six month or yearly intervals until adulthood.[18]

Widely divergent views are held regarding the need and mechanics of early diagnosis of hypertension in children. One extreme opinion is exemplified by the following quotes from a recent editorial in the British Medical Journal:[26] "In view of the expense and inconvenience alone, screening would be difficult to justify." "At present, the routine screening of blood pressure in normal children or teenagers has no prophylactic value." On the other hand in another commentary in Pediatrics,[10] the authors state, ". . . However, since the age of onset of the hypertension so lethal to adults is not known, the inclusion of blood pressure measurements as part of the physical examination should be mandatory in persons of all ages." According to Kilcoyne, "Routine blood pressure screening within the school system would appear to be the most effective means for early detection of hypertension."[27] In view of the high prevalence of juvenile hypertension, there is no question that blood pressures must be obtained in all children on routine office or clinic visits at least once a year.

The long-term prognosis of children with severe hypertension is so poor[19,28] that there is no question that they must be treated vigorously both by antihypertensive drug therapy to control the hypertension and, in secondary cases, by definitive therapy of the primary condition if possible. The picture is not nearly as clear regarding the treatment of mild or moderate hypertension in children. Londe prefers to watch these patients but does not use drug therapy.[18] Loggie arbitrarily starts drug therapy after definite hypertension has developed (supine diastolic pressure persistently above 90-95 mm. Hg.).[16] Weight reduction in obese subjects,[12] lowering of salt intake,[29] restriction of isometric exercises,[16] and avoidance of smoking may be helpful factors in the management of such patients, although they are difficult to achieve in practice.

Children with higher than average blood pressures in early childhood continue to have higher blood pressures as they become older.[30,31] It would appear likely that "borderline" hypertensive children and adolescents are perhaps at high risk for the later development of sustained hypertension. As such, their early detection and follow-up could be immensely beneficial in providing information regarding the origin and course of primary hypertension. This will only be possible if blood pressure determinations in children are made routinely and much more frequently than they are done now.

Follow-up studies of adolescents with hypertension have shown significant mortality and morbidity.[19,28] In adults, a beneficial effect of drug therapy has conclusively been shown in mild and moderate hypertensives.[32,33] If the results of such studies could be extrapolated to children, it could be argued that early therapy of mild hypertension would be beneficial in this age group also. Only careful and long-term studies will determine whether this hope is justified. Physicians who provide health care to children and adolescents can play an important role by careful documentation of the blood pressure of their patients on routine physical examination and thus detecting those whose blood pressures warrant further evaluation or therapy.

Krishna M. Saxena, M.D.*
St. Paul, Minnesota

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*Children's Hospital, St. Paul, Minnesota.
See references on page 666.

Computerized Tomography of the Head

WITH ACCUMULATING experience it has become quite clear that computed tomography (CT) of the head represents a signal advance in neurologic diagnosis. CT provides precise anatomical detail not previously available in the living patient and enormously improves the detection of almost all pathologic intracranial processes associated with gross structural changes. CT accomplishes this with a procedure which is rapid, safe and painless. In contrast to other neuroradiologic studies the CT scan may be easily used in an outpatient setting, thus avoiding the added cost of hospitalization, an important consideration in this era of cost consciousness in medicine.

Low risk to the patient permits CT to be employed at an earlier stage in illness and may disclose hitherto unsuspected lesions at a remediable stage, thereby decreasing long term disability with its attendant cost to patient and society. As Latchaw, Gold, and Tourje[1] point out, confidence in CT has increased to the point that no further neuroradiologic studies are required in most instances when the CT is normal.

As a consequence of this striking improvement in patient care, great demand for CT studies has developed. Current governmental attitudes limiting the expansion of CT facilities have resulted in serious strain on the existing units to meet this demand. Hopefully this will not result in curtailing the completeness of the examination of the individual patient.

Latchaw, Gold, and Tourje have extensively outlined their protocol for CT examination of suspected brain tumor cases and their well-reasoned basis for using the enhanced scan as the initial study in these patients. Occasionally this will result in some diagnostic uncertainty as in the instance of an unsuspected hemorrhage or in a rare situation where a lesion of decreased density may enhance to isodensity. There has been some criticism that the routine use of contrast enhancement has resulted in a study which is no longer noninvasive nor completely safe. It has therefore been suggested that a tumor be detected on the unenhanced scan and then more clearly delineated with contrast enhancement. As Latchaw, Gold, and Tourje correctly point out, however, contrast enhancement provides so much additional information that the investigation for a brain tumor cannot be considered complete without it.

Their paper clearly discusses the points of differentiation between tumor and the vascular and inflammatory conditions which may present with similar clinical and CT features. Our experience with CT in a neurologic clinic setting differs only in that the difficulty of returning a patient for restudy twenty-four hours later dictates the routine use of the unenhanced scan before contrast enhancement.

John M. McKelvey, M.D.
Minneapolis, Minnesota

References

1. Latchaw, RE; Gold, LHA; and Tourje, ET: Computerized Tomography of Intracranial Tumors. Minnesota Med 60: 9:554, 1977.

American Diabetes Association of Minnesota

The American Diabetes Association of Minnesota announces that applications are now being accepted for grants in diabetes research to be awarded in the Fall of 1977. Small grants of up to $5,000 for one year are available. For further information contact:

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WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

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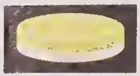

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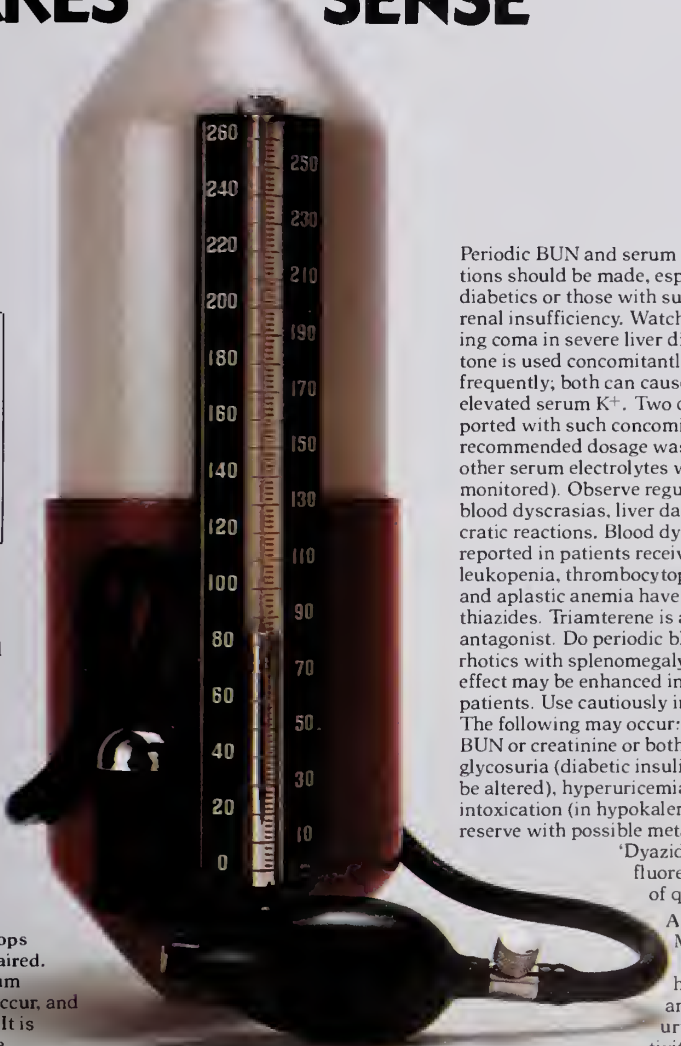

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ontraindications: Further use in anuria, rogressive renal or hepatic dysfunction, yperkalemia. Pre-existing elevated serum otassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

arnings: Do not use potassium supplements, ietary or otherwise, unless hypokalemia develops r dietary intake of potassium is markedly impaired. supplementary potassium is needed, potassium blets should not be used. Hyperkalemia can occur, and as been associated with cardiac irregularities. It is ore likely in the severely ill, with urine volume ss than one liter/day, the elderly and diabetics ith suspected or confirmed renal insufficiency. eriodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a iazide alone, restrict K^+ intake. **Associated idened QRS complex or arrhythmia requires rompt additional therapy.** Thiazides cross the lacental barrier and appear in cord blood. Use pregnancy requires weighing anticipated enefits against possible hazards, including tal or neonatal jaundice, thrombocytopenia, other dverse reactions seen in adults. Thiazides appear and triamterene may pear in breast milk. If their use is essential, the patient should stop ursing. Adequate information on use in children is not available.

ecautions: Do periodic serum electrolyte determinations (particularly portant in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis.

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Letter to the Editor

Electrotherapy and Renal Transplantation

Dear Editor:

I read with interest the recent article "Electrotherapy and Renal Transplantation, Impediment to Treatment" by Irving Bernstein, M.D., Dorothy Bernstein, M.D., and George R. Adzick, J.D.* I feel compelled to respond to the article as I am the Executive Director of the hospital in which the incident occurred and I was responsible for the decision with which the authors disagree. This decision was not made arbitrarily or capriciously. It was made after considerable thought and consultation with the physicians, the court and legal counsel with the rights and the welfare of the patient being of the utmost concern. At no time was the hospital inflexible in its decision, for the attending psychiatrist was informed of the options available to him, if he wished to initiate legally the treatment he thought indicated against the patient's wishes.

The article describes the case of a 24-year-old patient who had undergone a kidney transplant procedure in the fall of 1975. In September, 1976, she was voluntarily hospitalized with a diagnosis of schizophrenia with catatonic withdrawal and electric treatments were prescribed. As the authors state, the courts have determined that electrotherapy is an invasive procedure; therefore before this procedure or any other invasive procedure can be performed one of the following conditions must be present: (a) The patient consents to the procedure, (b) A court order is obtained authorizing the procedure, (c) In the absence of (a) or (b) the attending physician must obtain an opinion from another member of the medical staff that a life threatening emergency exists.

On September 23, 1976, the attending psychiatrist contacted administration requesting that he be given permission to perform electrotherapy on the patient. He stated that the parents had agreed to the treatment but that he was unable to gain consent form the patient for the suggested treatment. He was advised that electrotherapy would not be permitted without a court order except in the case of a medical emergency where the patient's life was in jeopardy. He indicated that this situation in his opinion constituted a medical emergency and he was therefore advised that a corroborating opinion from one additional physician would be necessary before he could proceed with the treatment. The attending psychiatrist consulted with one of his colleagues on the medical staff, an internist, who indicated that in his opinion this situation did not represent a life threatening medical emergency. In light of this the psychiatrist was advised that electrotherapy could not be administered until an appropriate court order or corroborating medical opinion was obtained.

Since the patient had not been legally committed to the hospital for treatment and since there was not sufficient evidence that a life threatening medical emergency did exist, it was the opinion of the hospital that the rights and wishes of the patient superseded the rights and wishes of the family and the physician. Until it is determined by a court of law that the patient is incapable of making a rational decision, the patient has a legal right to agree or disagree with the course of treatment being prescribed and the hospital has a responsibility to insure that this right is recognized and protected. Therefore it was felt that the hospital had a responsibility to protect the rights of the patient by not permitting the procedure.

After taking a position on this case hospital administration contacted the probate court and reviewed with them the details in the situation. They indicated that under the circumstances the approach that was taken by the hospital was the most reasonable, namely, to wait until the commitment proceedings had been completed and then let the court make the decision with respect to the appropriate course of action. In the meantime the attending psychiatrist still had the opportunity to secure a corroborating opinion from another member of the medical staff that the patient's life was in jeopardy. He either did not try or was unable to get such an opinion.

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*Minnesota Med 50:6:410, 1977.

The authors suggest that the action taken upon the part of the hospital was with disregard for patient rights. Indeed the rights of the patient were the foremost consideration in making this decision.

Peter H. Sammond
Executive Director
Mt. Sinai Hospital
Minneapolis, Minnesota

References

Hypertension in Children – Saxena (page 659).

1. McCrory, WW, Noonan, JA: Hypertension in childhood, J Iowa Med Soc 50:188, 1960.
2. Rosenheim, MC: Hypertension in children, Proc R Soc Med 54:1093, 1961.
3. Page, LB: Childhood hypertension. Etiology, investigation and treatment. Clin Pediatr 5:39, 1966.
4. Loggie, JMH: Hypertension in children and adolescents. 1. Causes and diagnostic studies. J Pediat 74:331, 1969.
5. Londe, S: Blood pressure in children as determined under office conditions. Clin Pediat 5:71. 1966.
6. Londe, S: Blood pressure standards for normal children as determined under office conditions. Clin Pediat 7:400, 1968.
7. Zinner, SH, Levy, PS, and Kass, EH: Familial aggregation of blood pressure in childhood. N Engl J Med 284:401, 1971.
8. Moss, AJ and Adams, FH: Problems of blood pressure in childhood. Springfield, Illinois. Charles C. Thomas. 1962.
9. Voors, AW, Foster, TA, Frerichs, RR, Webber, LS and Berenson, GS: Studies of blood pressures in children ages 5-14 years in a total biracial community: The Bogalusa heart study. Circulation 54:319, 1976.
10. Mitchell, SC, Blount, SG, Blumenthal, S, Hoffman, JIE, Jesse, MJ, Lauer, RM, and Weidman, WH: The pediatrician and hypertension. Commentary. Pediatrics 56:3, 1975.
11. Masland, RP Jr, Heald, FP Jr, Goodale, WT et al: Hypertensive vascular disease in adolescence. New Eng J Med 255:894, 1956.
12. Lauer, RM, Connor WE, Leaverton, PE et al: Coronary heart disease risk factors in school children: the Muscatine study. J Pediat 86:697, 1975.
13. Kilcoyne, MM, Richter, RW, Alsup, PA: Adolescent hypertension I. Detection and prevalence. Circulation 50:758, 1974
14. Kimura. T and Ota, M. Epidemiologic study of hypertension, comparative results of hypertensive surveys in two areas of northern Japan. Am J Clin Nutr 17:381, 1965.
15. Londe, S, Bourgoignie, JJ, Robson, AM et al: Hypertension in apparently normal children. J Pediat 78:569, 1971.
16. Loggie, JMH: Hypertension in children and adolescents. Hosp Practice (June): 81-92, 1975
17. deCastro, FJ, Biesbroeck, R, Erickson, C et al: Hypertension in adolescents: A significantly high prevalence among students attending an inner city school. Clin Pediat 15:24, 1976.
18. Londe, S and Goldring, D: High blood pressure in children: Problems and guidelines for evaluation and treatment. Amer J Cardiol 37:650, 1976.
19. Heyden, S, Bartel, AG, Hames, CG et al: Elevated blood pressure levels in adolescents. Evans County, Georgia. Seven year follow-up of 30 patients and 30 controls. JAMA: 209:1683, 1969.
20. Loggie, JMH and Rauh, LW: Persistent systemic hypertension in the adolescent. Med Clin N Amer 59:1371, 1975.
21. Singh, SP and Page, LB: Hypertension in early life. Amer J Med Sci 253:255, 1967.
22. Ooi, BS, Chen, BT, Toh, CC et al: Causes of hypertension in the young. Brit Med J 3:744, 1970.
23. Kilcoyne, MM: Adolescent hypertension. II. Characteristics and response to treatment. Circulation 50:1014-1019, 1974.
24 Nelson Textbook of Pediatrics, Ed. Vaughn, VC III, McKay, RJ, Nelson, WE. W. B. Saunders Co., Philadelphia, pp. 1097, 1975.
25. Pediatrics, Ed., Barnett, HL and Einhorn, AH. Appleton Century Crefts, New York. pp. 1437, 1972.
26. Editorial. Detection of hypertension in childhood. Brit Med J 3:365, 1973.
27. Kilcoyne, MM. Adolescent hypertension. Editorial. Amer J Med 58:735, 1975.
28. Still, JL and Cottom, D: Severe hypertension in childhood. Arch Dis Child 42:34, 1967.
29. Dahl, LK: Salt and hypertension. Amer J Clin Nutr 25:231, 1972.
30. Buck, CW: The persistence of elevated blood pressure first observed at age five. J Chr Dis 26:101, 1973.
31. Kaufman, JJ, Goodwin, WE, Waisman, J and Gyepec, MT: Renovascular hypertension in children. Am J Surg 124:149, 1972.
32. Veterans Administration Cooperative Study Group on Antihypertensive Agents: Effects of treatment on morbidity in hypertension. I. Results in patients with diastolic blood pressures averaging 115 through 129 mm. Hg. JAMA 202:1028, 1967.
33. Ibid. II. Results in patients with diastolic blood pressures averaging 90 through 114 mm. Hg. JAMA 213:1143, 1970.

Rheumatoid Arthritis in Children – Ozel and Kottke (page 639).

1. Duthie, JJR: The fundamental treatment of rheumatoid arthritis Practitioner 166:22, 1951.
2. Partridge. REH and Duthie JJR: Controlled trial of the effect of complete immobilization of the joints in rheumatoid arthritis. Ann Rheum Dis 22:91, 1963.
3. Partridge REH: The basic management of rheumatoid arthritis in Modern Trends in Rheumatology. ED. A.G.S. Hill. New York. Appleton-Century-Crofts, pp. 188-202, 1966.
4. Gault, SJ and Spyker. JM: Beneficial effect of immobilization of joints in rheumatoid and related arthritidis. A splint study using sequential analysis. Arth Rheum 12:34, 1969
5. Kamerman, JS: Protective effect of traumatic lesions in rheumatoid arthritis Ann Rheum Dis 25:361, 1966.
6. Thompson. M and Bywaters. EGL: Unilateral rheumatoid arthritis following emiplegia. Ann Rheum Dis 21:370. 1962.
7. Bland, JH and Winston, ME: Hemiplegia and rheumatoid arthritis. Arth Rheum 11:72. 1968.
8. Glick, EL: Asymmetrical rheumatoid arthritis after poliomyelitis. Brit Med J 3:26, 1967
9 Lindhjerg, JF: Juvenile rheumatoid arthritis —A followup of 75 cases. Arch Dis Child 39.576. 1964
10. Calabro. JJ and Marchesand, JM. Prognosis in juvenile rheumatoid arthritis (JRA(—A ten-year follow-up Arth Rheum 13:310, 1970.
11. Evans, EB. Eggers. GWN. Butler, JK and Blumel, J. Experimental immobilization and remobilization of rat knee joints. J Bone Joint Surg 42A.737, 1960.
12. Hall, MC: Cartilage changes after experimental immobilization of the knee joint of the young rat J Bone Joint Surg 45A:36, 1963.
13. Thaxter, TM, Mann. RA and Anderson, CE: Degeneration of immobilized knee joints in rats. Histological and autoradiographic study. J Bone Joint Surg 47A:567, 1965.
14. Firsterbush. A and Friedman B: Reversibility of joint changes produced by immobilization in rabbits. Clin Orthop 111:290, 1975.
15. Woo, SL. Matthews. JV, Akeson, WH, Amiel, D and Convery, R: Connective tissue response to immobility: correlative study of biomechanical and biochemical measurements of normal and abnormal rabbit knees. Arth Rheum 18:257, 1975.
16. Enneking, WF and Horowitz. M. The intra-articular effects of immobilization on the human knee. J Bone Joint Surg 54A:973, 1972.
17. Mills, JA, Pinals, RS, Rodes, MW. Short, CL and Sutcliffe, J: Value of bedrest in patients with rheumatoid arthritis. N Engl J Med 284:453, 1971.
18. Lowman. EW: Connective Tissue Disease in Handbook of Physical Medicine and Rehabilitation. Ed. F.H. Krusen, F.J. Kottke, P.M. Ellwood, Jr., Second Edition. W B. Saunders Co., Philadelphia, Pennsylvania, pp. 554-565, 1971.
19. Kottke, FJ: Therapeutic Exercises in Handbook of Physical Medicine and Rehabilitation. Ed. F.H Krusen, F.J. Kottke. P.M. Ellwood, Jr., Second Edition. W.B. Saunders Co., Philadelphia, Pennsylvania, pp. 385-428, 1971.
20. Kottke, FJ. Pauley, DL and Ptak, RA: The rationale for prolonged stretching for correction of shortening of connective tissue. Arch Phys Med Rehab 47:345, 1966.
21-44 Can be secured from the authors.

Professional Values

This question of professional values began in earnest for medicine in December, 1975, when the Federal Trade Commission "saw" the profession restricting competition by prohibitions on advertising and by use of relative value indices. Apparently the absence of "commercials" means competition doesn't exist and placing an economic value on an appendectomy relative to a gastrectomy is price fixing. As physicians we may correctly diagnose bureaucratic myopia and then go busily (but "unseen") competing in our professional way with personalization, timeliness, expertise, and (believe it or not) out-of-hospital price of service.

But we should not let the FTC's myopia or political rhetoric (that professions *are* commercial associations) obscure two really valid points. (1.) A profession may become a mere commercial association if the purposes of the profession have the appearance or the reality of being self serving. A good example would be a physician accepting a rebate from a hospital, laboratory, or consultant for ordering care or the less familiar rebate from an HMO company for decreasing orders that expend premium dollars. (2.) And laws applicable to commercial associations may apply when professionals have a commercial interest in their patients.

Although self-serving interests are acceptable in commercial enterprise, physicians maintain their *non*-commercial status by 'professing' to put the patients' well-being ahead of their own (R. Magraw, NEJM 279:383, 1968). For practical policy, physicians limit the source of their income to medical services rendered (Principles of Medical Ethics, 1969). Profits (i.e. contingency payments) then become unacceptable payments for something *other than* services rendered the patient such as a physician's "good behavior" in ordering care where "good" is viewed from the perspective of the person or company paying rebates.

Maybe the FTC in its myopic blunderings to destroy professional prohibitions on commercial activity will ultimately help define the real purposes of professional values. In medicine these purposes are the protection of the public from manipulation by physicians or by bureaucratic-insurance-provider conglomerates having power in the medical market place to serve their own purposes of control, business expansion, and profits. Advertising, for example—and let us carefully distinguish solicitation from information—is only meant to gain or maintain these commercial goals whether the industry is a competitive grocery store or a *non*-competitive electric utility. Imposition of solicitation on medicine would not create competition but only celebrate a change from professional to commercial competition—a change that may become a reality if some of the new insurance-provider conglomerates are successful in "marketing" their policies to industrial and governmental "buyers" of care. Then the public will deal with entrepreneurs rather than professionals for their health care and the FTC can be congratulated on their foresight if not their good vision.

Chief Justice of the Minnesota Supreme Court, Robert Sheran is uniquely responsible for the professional values of the Minnesota Bar. Elsewhere in this issue[†] are published his comments on professional values. He addressed a combined meeting of the Ramsey County Bar Association and the Ramsey County Medical Society on February 28, 1977.

Robert W. Geist, M.D.
President
Ramsey County Medical Society

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[†] See page 669.

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The Learned Professions — A Trade or A Business

CHIEF JUSTICE ROBERT J. SHERAN*

IT IS A PRIVILEGE to be able to address this joint meeting of the Ramsey County Medical Association and the Ramsey County Bar Association. The purpose of the meeting, as I understand it, is to make plans for joint action in support of mutual interests. Efforts of this kind are most necessary. I say this although I am aware of the differences and occasional hostilities which separate the medical and legal professions. These are attitudes which are difficult to explain. Perhaps it is because the scientific regimen which characterizes aptitude for and success in medical training is quite different from the interests and aptitudes which lead students to pursue studies in the legal field. Perhaps it is because the demands of the professions are such as to make us less tolerant than we should be of other people's limitations. Perhaps it is simply "professional jealousy." Whatever the reason, all of us are aware of the difficulties in securing cooperation between the learned professions. No one can reasonably anticipate that meetings of this kind, whatever their scope and frequency, will provide instant solutions to the problems of medical-legal relationships. It is reasonable to expect, however, that by joint effort we can increase our contribution to the public welfare to some extent. And if this is done, certainly the effort is worthwhile. But even if it comes to nothing, we should do it. To the mountaineer, the reason for climbing a hazardous precipice is that it is there. For us, it is that questions demand answers. We are obliged to respond to the problem whether we succeed in solving it or not.

The key to cooperation is identification of areas of agreement as between people who sometimes disagree. Emphasis on variant views serves no useful purpose. The necessity is to find factors of agreement and to build from there.

There are certain principles, I believe, which all of us here accept:

The distinctive and most treasured characteristic of humanity is the ability to learn. It is distinctive, because no other living organism has in an equivalent degree the capacity of abstracting knowledge from experience. It is most treasured because the accumulated learning of mankind is the essence of civilization. Test the truth of these observations: We all see individuals who, having committed themselves to the accumulation of material rewards or the acquisition of power as a goal in life, are disillusioned and disappointed with the goal once achieved. There are few if any of us, I submit, who can find in their experience anyone who has committed himself to the importance of learning and has in the end concluded that the prize was unworthy of the race. Somehow, the processes of learning and the wisdom developed by these processes are an unfailing source of satisfaction to those who make a commitment to the significance of knowledge.

Physicians and lawyers pursue practical areas of learning and share the conviction, I believe, that the forms of learning which advance the wellbeing of humanity are the most worthwhile. The collegian's delight in speculating as to the number of angels who might dance on the head of a pin is fascinating as an intellectual exercise, but for most people of our background the preference is for learning which improves the quality of human life.

The fact that learning can be used for the personal advantage of the learner is no reason to apologize for its worth. To employ learning for one's personal advantage is a rational response. The judgment of one who found pleasure in the concept of the wheel but refused to use it to convey that which once was carried would be open to serious question. It is not the use of knowledge for personal advancement that gives alarm, but its misuse.

For people committed to the learning process to develop abilities and skills superior to those of people generally and to use these abilities to exploit the weaknesses or inadequacies of others is a form of intellectual abuse which gives offense to the reasonable mind. Those who claim membership in the learned professions are and must be revolted by the instances where such misuse of learning does occur.

The employment of learning by the "learned professions" is uniquely conditioned. We recognize that the use of knowledge and experience, if it is to be virtuous, must be in the service of others. Virtue in this sense is difficult to define except by illustration. Experience teaches that people in the "learned professions" who are respected, admired, and imitated by their colleagues employ learning in a virtuous way as an expression of personal and professional conviction.

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*Chief Justice of Minnesota Supreme Court.

What it comes to is that one who claims entitlement to membership in a "learned profession" must find his satisfaction and rewards primarily in the skillful, timely, and compassionate service he renders to his client or his patient rather than in the material exchange incidental to this relationship.

I believe that the members of the medical and legal professions agree on these general statements of principle. We can accept Dean Roscoe Pound's definition of a profession as "a group*** pursuing a learned art as a common calling in the spirit of public service — no less a public service because it may incidentally be a means of livelihood."

The heart of the professional relationship is its fiduciary character. People who call upon doctors and lawyers for their services do so most frequently out of necessity. The necessities may be those of physical health or psychic wellbeing. The necessities may be those of the preservation of individual liberty or the maintenance of a degree of harmony in what would otherwise be contentious relationships. In any event, the patient and client seek professional help because the imperfections to which human nature is heir have placed them in need of expert assistance. People so positioned are dependent and vulnerable. Dependence and vulnerability on the one hand and skill and capacity on the other give rise to a relationship of trust and confidence, the fulfillment of which is the essence of professionalism.

Professionalism is more than an individual frame of mind. It is a collective response to a common experience. The history of the learned professions demonstrates that this collective response must share certain essential characteristics:

A learned profession must be motivated by aspiration for and commitment to idealism. There must be on the part of the members of a profession a recognition that the employment of the principles of learning and knowledge which they have mastered is in some way a manifestation of the perfect truth, the perfect harmony, the perfect justice which accounts for the existence of the universe.

Mere good will and idealism are not enough. Members of the learned professions above all must be competent. They must be able to apply to complex problems the sophisticated and precise solutions which are the fruits of learning. There must be excellence of performance in addition to loftiness of motivation.

The members of a learned profession must be disciplined. Their learning and training have given them a certain measure of authority and power with respect to the problems of others. The proper use of this authority makes imperative strict and self-imposed standards of performance without which the privileges of duty become the excesses of license.

These aspects of professionalism were summarized by Dean Roscoe Pound when he referred to it as consisting "in the ideals which its members maintain, the dignity of character which they bring to the performance of their duties and the austerity of the self-imposed ethical standards." The use of the words "self-imposed" is to me most significant.

In these days I would add another characteristic to the essentials of a learned profession: To survive, the learned profession must develop a capacity for communication — communication with the people whom they serve and communication with the public which reacts to their service. Both doctors and lawyers are subject to regular beratement in the media. Let me cite some examples: In the Harris Column printed in the St. Paul Pioneer Press for June 18, 1974, this is written:

> "Doctors do not police themselves any better than lawyers do, or most other groups of this sort. Their codes of ethics look noble on paper, but there is a vast difference between preachment and practice: Both doctors and lawyers practically have to commit indictable crimes before delicensing or disbarment proceedings are brought against them.
>
> "The only way for a professional group with public responsibilities to avoid increasing government control or the heavy hand of the jury is to take preventive action itself, and create an internal policing force that effectively deters negligence, ignorance, and greed. Otherwise, the long, hairy arm of the state is certain to dominate these areas."

These comments are taken from the Kofoed Column which appeared in the news media during the past week:

> "Malpractice insurance is one reason for the devastatingly high cost of medical care, and the sharpies responsible for that are legal beagles who specialize in malpractice suits. Now that bag is coming home to roost on the whole legal profession. I gather from statistics that doctors beat 75 to 80 per cent of malpractice suits, though when an M.D. loses, the judgment is usually staggering. Suits for legal negligence are becoming a more popular pastime, and again statistics bring to light an interesting comparison. In something like 85 per cent of cases, the verdict goes to the plaintiff. Juries are often swayed by other factors than the evidence. So, it would seem doctors rate higher in public esteem than lawyers. As a matter of fact, it was an attorney, not I, who said, 'A lawyer is the only individual in whom ignorance of the law is not punished.' "

These examples are merely illustrative of many that might be cited. I chose these two because, as between them disparagement of doctors and lawyers seems of about equal intensity. In each there is a certain element of truth. But, for the most part, the charges are inconsistent with the experience of those most intimately aware of the performance of the professions of which we are members. Given the constant exposure of clients, patients, and the general public to comments of this kind, it behooves the learned professions as matters of both self-preservation and public interest to increase our ability to communicate with the people whose needs we serve.

The necessity of communication comes also from the fact that currently the worth of the professions is challenged. In part, this challenge comes from the circumstance that a profession is by definition an established area of specialized learning. In an era when the "establishment" in every form is subject to criticism it is only to be expected that the establishments of which we are a part would be so, also. In addition, many people look upon the medical profession and the legal profession as forms of monopoly. Comparison is made, subconsciously at least, with such institutions as public utilities, which are accorded special treatment under the law not available to the public generally. In many respects, the comparison is not apt, but in some respects it is. Because it is true that the requirements of aptitude, learning, and skill which are conditions of admission to the legal and medical professions limit these pursuits to some 500,000 in the United States in the case of lawyers and somewhat fewer in the case of medical practitioners, there is bound to be a measure of resentment on the part of those who do not share this opportunity for professional service.

Finally, and perhaps most significant, the rewards in terms of compensation and social prestige which come to those who, after many years of training, have succeeded in the profession are high as compared to that of people generally. In assessing the validity of this observation, we must keep in mind that the average family income in the United States is in the neighborhood of $10,000 annually. Making comparison between this average and that received by doctors and lawyers after a quarter century of education and training is misleading. But it gives rise to a measure of resentment, whether justified or not.

Perhaps there is no complete answer to these challenges or the reasons for them. This much, though, is clear: The learned professions, if they are to be more than a trade or business, must emphasize internally austere self-discipline. We must communicate by word and—more important—by deed to patients, to clients, to the public that the distinctive characteristics of the learned professions further the interests of the individuals and the public whom the professionals serve.

Failing this, we must look forward to increasing political regulation of all the professions, including medicine and law. Recent decisions of the United States Supreme Court seem to make it clear that the learned professions will not be exempted from governmental regulation because of traditions honored in the past. We have long relied on Mr. Justice Story's frequently quoted statement in *The Nymph,* 18 F Cas. 506:

> "* * * The word 'trade' is * * * generally used * * * as equivalent to occupation, employment, a business whether manual or mercantile. Wherever any occupation, or employment, or business is carried on for the purpose of profit, or gain, or livelihood, not in the liberal arts or in the learned professions, it is constantly called a trade."

The historic distinction between trades and professions comes from the idea that the public needs to rely on a professional because of its ignorance in his area of competence. Public trust follows motivation by ethical standards and not by material gain.

As long ago as 1931-1932, the United States Supreme Court seemed to recognize this distinction in holding the medical profession not subject to the restraints of the federal anti-trust acts. But recent trends in the law indicate that these attitudes may no longer prevail. For example: In Virginia, *State Board of Pharmacy v. Virginia Citizens Consumer Council, Inc.* 425 U. S. 748 (1976), it was held that a Virginia statute forbidding price advertising of drugs violated federally protected First Amendment rights. In *Bigelow v. Virginia,* 421 U.S. 809 (1975), a Virginia Statute forbidding the advertising of abortion services was similarly invalidated, upon the ground that it was an intrusion upon the right to free commercial speech having the protection of the First Amendment to the Constitution. And on the same day that the *Bigelow* case was decided, the United States Supreme Court held that a minimum fee schedule enforced by the state bar violated the Sherman Act. *Goldfarb v. Virginia State Bar,* 421 U.S. 773 (1975).

The decision of *Bates and Van O'Steen v. State Bar of Arizona,* presently under consideration by the United States Supreme Court, will tell both the legal and medical professions a great deal as to whether self-regulation of the learned professions will be acceptable in the future. In that case, Arizona attorneys, in violation of a rule of the Supreme Court of the State of Arizona, advertised in a Phoenix newspaper, listing their fees for various legal services. The rule of the Supreme Court of Arizona is that such advertising undermines the professional responsibilities of lawyers as members of a learned profession. The argument in opposition is that restraints of this kind are a curtailment of First Amendment protected rights of free speech and a violation of the Sherman Act, which forbids restraints upon competition involving or affecting interstate commerce.

The decision in the *Bates* case will be of the keenest interest to all professions. Whatever the outcome of that particular case may be, national attention and concern which it attracts should make it clear to all of us that we will be increasingly subject to government regulation, either federal or state, unless we can satisfy the public generally that community interests are best served by forms of self-regulation effectively formulated and vigilantly applied to prevent violations of the fiduciary relationship which is professionalism.

Earlier in this discussion I have mentioned the historical differences which have been experienced in securing cooperative efforts between the learned professions in the furtherance of those interests and values which we have described. In recent years there have been developments, however, which suggest that there may be reason for optimism; that solutions will be found through joint effort. Within the past decade there has been an increased effort to enhance the comprehension of members of the learned professions concerning the interests of other professionals. Examples include the Forensic Science Foundation; the American College of Legal Medicine; the American Academy of Forensic Sciences, and the frequent interchange between faculty members of the professional schools. On an organizational level, there has been similar progress. The American Bar Association has established a special committee on law and medicine, the deliberations of which have attracted favorable attention. The American Society of Law and Medicine has attracted over 1500 members who emphasize learning in the fields of both law and medicine. The renewal of a joint committee made up of members of the Ramsey County Medical Association and the Ramsey County Bar Association is a further illustration of what can be done. Certainly the need is great. Some solution must be found to the problems which have developed in the areas of medical malpractice in such states as California, Maryland, and New York; problems which leaders in the American Bar Association and elsewhere predict will be duplicated within the legal profession within the next five or six years. If the American public is convinced that people who suffer loss should be compensated without regard to the existence of provable fault, it behooves the medical and legal professions to participate in the process by which methods of compensation can be developed which are reasonable and affordable. The increasing need for and cost of medical care—now claiming almost ten percent of our gross national product—is or will be paralleled by increasing demands for legal services at prices people can afford to pay. The problem of making competent professional services available at reasonable cost without government intrusion is one which deserves joint consideration. We can be encouraged to believe that joint efforts will be productive by the experiences that some states have had in a joint medical and legal attack on the problems of drug abuse. In the courtroom, the misuse of expert testimony which frequently degenerates into a form of advocacy rather than a search for scientific truth and the rights and protections afforded to the mentally disabled are examples of where medical and legal expertise is demanded. And, finally, in such sensitive and controversial areas as sterilization, abortion, and euthanasia, the conflict between the rights of the individual on the one hand and the sensitivities of conscience of many of our citizens on the other must be brought into adjustment by the forces of reason rather than strident emotionalism.

These are the areas of common concern which come first to mind, but they are no more than illustrative of the many that should jointly concern us. If the effort is to be productive, the underlying motivation must be that of preserving the freedom to serve which through the centuries has been the significant characteristic of the learned professions. As members of the learned professions we seek to preserve the privileges of self-discipline in preference to the impositions of government control. Whether we can do so depends on whether self-regulation assures our ability to meet the needs of the patients and clients we serve and, if it does, on our ability to communicate this fact to the general public which, in the end, will make the critical judgment.

Special Article

Adverse Reaction to Large Doses of Human Immune Serum Globulin (ISG)

Clinical Observations

HEINZ H. BRUHL, M.D.*

I.M. administration of large doses of ISG caused severe allergic reactions in 25% of recipients. Prolonged ISG storage seemed to increase its antigenicity through polymerization.

HUMAN IMMUNE SERUM globulin (gamma globulin, ISG) is administered extensively in the United States for two main purposes: (1) to confer passive immunity to viral infections such as Hepatitis-A, measles and vaccinia, and in certain phases of tetanus, pertussis and recurrent upper respiratory tract infections; and (2) as replacement therapy in immunological deficiency syndromes such as agammaglobulinemia and dysgammaglobulinemia.[1]

The intramuscular injection of ISG is assumed to be rarely associated with untoward effects, in contrast to the comparatively frequent reactions following its intravenous administration.[2,3] However, recently several authors have reported adverse reactions to the intramuscular administration of ISG in a dozen cases, particularly when large doses had to be given repeatedly.[4-8]

Our similar experience with a comparatively large number of individuals merits reporting because ISG has been considered an innocuous therapeutic agent. We wish to alert the medical profession to the potential for such reactions, especially when the application of doses larger than 2.0 ml is contemplated.

Background

Since November, 1970, we have studied the prevalence of hepatitis-B-surface antigen at the Faribault State Hospital, in collaboration with the Minnesota Department of Health. Among residents we found an overall carrier rate for hepatitis-B-surface antigen (HB_sAg) of 8%, a carrier rate of 24% among those with Down's Syndrome, but only one transitory carrier among our staff of 950, which equals 0.1% in the general population. The highest carrier rate of 23% was found in dormitory "P" housing 80 ambulatory, severely retarded teen-age boys; 13 of 22 Down's Syndrome residents (59%) in this building had a chronic asymptomatic HB_s-antigenemia.

In the past 20 years Faribault State Hospital has experienced two epidemics of viral hepatitis, one in 1953-54 with 236 cases (217 residents out of 3200, and 19 employees out of 640), the second one in 1960-61 with 277 cases (250 residents, out of 3150, and 27 employees out of 670). Since then, we have seen only sporadic cases: from 1971 to 1974, six cases of acute (Au-positive) hepatitis-B in a population of about 1500 residents. In the same time period, 11 employees had acute hepatitis, three of type A, and eight of type B. Interestingly, five of the eight hepatitis-B cases occured among the 80 employees of dormitory "P", while the other six hepatitis cases (three type A and three type B) were observed among the remaining 900 Faribault State Hospital staff. The attack rate for viral hepatitis among the staff of dormitory "P" was 10 to 20 times higher than among the staff of the entire Faribault State Hospital campus.

One of the five employees of dormitory "P" who developed Hepatitis-B was a psychiatric technician, the four others were "Project-Teach" or "TMR" teachers who were in close daily contact with some of the HB_sAg carriers, teaching them proper eating, dressing, bathing and toilet habits. In January, 1971, one of these teachers had

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helped cleaning blood from the face of an eight-year old boy who had injured a front tooth and bled profusely. He had Down's Syndrome and was a HB$_s$Ag carrier. Forty four days later, she developed acute hepatitis with severe jaundice, which required hospitalization. She was found positive for hepatitis-B$_s$-antigen, recovered completely, and became HB$_s$-antigen negative again nine weeks later.

There were two more hepatitis-B cases among the staff of building "P" in 1973. When in March and April 1974, in short succession, one psychiatric technician and one "TMR" teacher of dormitory "P" developed hepatitis-B, the staff became alarmed and the school administration asked us to consider the prophylactic use of ISG for the entire teaching and care staff of that building.

In the past the Faribault State Hospital had followed the generally accepted policy to give prophylactic ISG only to contacts of hepatitis-A (infectious hepatitis), for which the protective value of ISG in doses of .01 to .02 per lb. body weight (max. 2ml) is firmly established. In view of the conflicting reports and the lack of convincing evidence, the Center for Disease Control in Atlanta, Ga. advises against the routine administration of ISG in transfusion-associated hepatitis-B (serum hepatitis). Recent reports, however, suggested possible protective value of large doses of human ISG against non-parenterally acquired hepatitis-B. In 1971 a prospective double blind study on 107,800 USA service men in Korea demonstrated a significant protective effect of 5ml and 10ml of ISG against HB$_s$Ag negative as well as HB$_s$Ag positive hepatitis.[9,10] Similarly, 4 to 6 serial injections of 1 ml. of ISG, given to mentally retarded children on admission to three State institutions, significantly lowered the attack rate for clinical hepatitis-B and for hepatitis-B$_s$ antigenemia.[11]

On the basis of these reports it was decided to administer large doses of Standard ISG to the entire staff of dormitory "P", partly for psychological reasons, and partly for the possibility of protection. Dr. Dean Fleming, then Director, Division of Personal Health Services, Minnesota State Board of Health, concurred in this decision.

Administration of ISG

Human ISG was offered to all employees working in dormitory "P", on a voluntary basis, May 7, 1974 to 39 members of the dormitory staff, on May 8, 1974 to 97 TMR teachers and teacher aides. Ten cc were administered (in two simultaneous doses of 5cc) to 83 members of the "direct" care staff which included nurses, psychiatric technicians, foster grandparents, occupational and physiotherapists and teachers who were in *close* daily contact with the residents. Two cc of ISG were given to 52 "indirect" care staff such as food service workers, janitors, social workers, secretaries and office staff. Eighteen employees did not participate for various reasons.

Clinical Observations

A few days later, we learned from several private physicians in Faribault that they had been consulted by about six of the employees because of severe side reactions with local reactions, fever, chills, malaise and boneache. One employee had even been hospitalized for five days with high fever (102°-104°), dizziness and severe emesis lasting 36 hours.

An investigation had the following results: Twenty-one (25%) of the 83 people who received *10cc* of ISG, developed adverse reactions. Nine had "early" reactions within one and a half, five and 24 hours, 12 showed "intermediate" reactions between the second and fifth day after injection, none had delayed reactions (eighth to 10th day) (Tables 1 and 2).

TABLE 1
ISG Dose and Adverse Reactions

Dose	Number of People Inoculated		Number of People with Reactions	
10 cc	Group I	29	14	48%
	Group II	54	7	13%
	Total	83	21	25%
2 cc	Total	52	2	4%

TABLE 2
Adverse Reactions to 10 ML ISG

Number People With Reactions		Local Reaction	Fever	Systemic Reaction	Early Reaction 1st 24 hrs	Intermediate Reaction 2-5 days	Duration 1-2 ds	3-4 ds
Group I	14	9	5	9	9	5	9	5
Group II	7	6	6	7	—	7	3	4
Total	21	15	11	16	9	12	12	9

The following symptoms appeared in varying severity and combinations:

15 had local reactions with swelling, induration, inflammation and tenderness on the injection site.

11 had chills and fever (five of low degree, four between 101° and 102°, two between 103° and 104°).

16 had systemic reactions in form of headaches, dizziness, general malaise, stiffness, myalgia, arthalgia, backache and lumbago.

11 had nausea, one had severe protracted emesis.

Three had diarrhea and stomach cramps. One had enlargement of inguinal glands, none had a rash.

In 12 individuals these signs persisted for one to two days, in 9 others for three to four days. Only two among 52 people who received *2cc* of ISG, experienced mild reactions on the fourth day with local tenderness and inflammation of 12 hours' duration, one also with some headache, drowsiness and upset stomach lasting one day.

Discussion

The symptoms of several of these cases, especially the severe ones, were confirmed by five private physicians at Faribault and diagnosed as "hypersensitivity" reactions to the large doses of ISG.

Several possible causes have to be considered:

1. Contamination of the ISG during storage or administration.
2. Allergic hypersensitivity reactions.
3. Alteration or denaturation of ISG during storage.

1. 10cc ISG was administered at room temperature in two simultaneous doses of 5cc deep intramuscularly in both gluteal regions by an experienced Registered Nurse, using aseptic technique and individual disposable syringes and needles, for each 5cc.

The ISG given to the first group of 39 dormitory staff members on May 7, 1974 was ISG (human) purchased December 18, 1972, stored in the pharmacy refrigerator at 34° to 35°F, with an expiration date of April 1, 1975. *Some of its vials were slightly discolored and turbid.* None of the 10cc vials had been tapped before. The ISG given to the second group of 97 teachers on May 8, 1974 was Standard ISG (human), purchased May 6, 1974 (!), stored in refrigeration at 34° to 35°F., with an expiration date of March 12, 1977. None of these 10cc vials had been tapped before, excluding the likilihood of bacterial contamination.

2. The symptoms cited above are characteristic for "hypersensitivity reactions" as seen after injection of foreign serum or occasionally after repeated blood transfusion. Only one case had enlargement of glands. However, none showed skin eruption, pruritus or facial edema. In this respect our cases resemble the other cases reported with hypersensitivity reactions to intramuscular administration of ISG.[1-8]

The employee who required hospitalization for fever of 104° and protracted emesis presented the following physical signs: 27 years old white female in good nutritional state, with general muscular pains particularly in the neck, bilateral frontal and occipital headaches, no nuchal rigidity. There were warm erythematous patches and induration of 10 cm diameter in both gluteal regions at the injection site. No signs of dehydration. Circulation normal. The blood pressure was 164/80 mm/Hg. There was no skin rash or enlargement of lymph nodes. All other physical findings were normal. Laboratory data: Hbg. 13.3 gm/dl., WBC 9,900/cumm, Diff: 75% segm, 1% eos, 24% lymph. Routine blood chemistry data (SMA profile) were normal. A chest roentgenogram also was normal.

A point in favor of an allergic hypersensitivity reaction is the fact that in group I 71%, in group II 43% had a history of previous ISG inoculations (Table 3). Those with a history of several prior injections appeared to show the severest and fastest reactions. Finally, the reactions reported here, were definitely dose-related (Table 1). In contrast to two reactors (4%) among 52 persons who received 2cc of ISG, 21 (25%) of 83 people showed local and/or systemic reactions to 10 ml. ISG.

TABLE 3
Prior Exposure to ISG

	Total Number of Reactions	Prior ISG Inoculations	
Group I	14	10	71.4%
Group II	7	3	43 %
Total	21	13	62 %

According to institutional records, from 1953 until 1974, a total of 4400 doses of ISG (max. 2.0 ml) had been given, 2900 to residents, 1500 to staff members of Faribault State Hospital. This includes the years of viral hepatitis epidemics in 1953/54 and in 1960/61, and prophylactic administration of ISG to contacts of sporadic cases in the other years (on the average 3.6 cases among residents and 2.6 cases among personnel per year). No untoward reactions have come to our attention, except for occasional minor local discomfort at the injection site. Table 4 gives the percentages of reactions as reported in the literature. [12,13,21]

3. Allergic hypersensitivity reactions to human ISG are difficult to comprehend since ISG is prepared from hemologous pooled plasma. Allergic and even "anaphylactic" reactions following intramuscular administration of homologous ISG have been observed mainly in cases of agammaglobulinemia and dysgammaglobulinemia, who had received doses of 10 to 30 ml repeatedly over the years and appear to be particularly sensitive[1-7] (Table 4). These reactions have been attributed either to possible contamination of ISG during processing (for instance by silk),[4,5] to added preservatives as penicillin or thimerosal (methiolate)[4,14] or to placental substances whenever ISG derived from human placental tissue was used[4]. Also the possibility was considered that *genetically* determined factors present in the gammaglobulin molecules, might cause antibody formation and reactions in individuals lacking a particular Gm or Inv type[1,15].

TABLE 4
Adverse Reactions to ISG

Condition	Route	Administration Quantity ISG	Frequency	Authors
A-gamma- and dys-gamma-globulinemia	i.v.	30-50 ml	93.3%	Barandun S. 1961-62
Normal Controls	i.v.	30-50 ml	12.7%	Barandun S. 1961-62
Normal Population	i.m.	2.0 ml	1.2%	Gross P. Gitlin Janeway C. 1959
Hepatitis-B prophylaxis in normals	i.m.	5.0 ml	9.0%	Redeker, Mosley Gocke D. 1975
Hepatitis-B prophylaxis in normals	i.m.	10.0 ml	25.0%	Bruhl H. H. 1975

Lately it has been shown that during *processing and storage*, many commercial ISG preparations tend to undergo *denaturation* and *polymerization*[1-7,15,16]. The ensuing IgG aggregates appear to be biologically active and antigenic, and may stimulate antibody synthesis in suitable individuals.[4-7,16-19] These aggregates have been shown to fix complement in vitro[16,17] and in vivo[2]. Antibodies to these aggregates have been demonstrated in serum occasionally[6,20]. Allergic reactions to IgG aggregates have been prevented either by their cleavage by acid hydrolysis[3,13] or by digestion with proteolytic enzymes (pepsin or plasmin[2,21,22]), or their removal by ultracentrifugation of the ISG prior to administration[7].

Repeated I.M. administration of ISG may therefore in "sensitized" individuals produce antigen-antibody reactions as described here. occasionally even cause severe anaphylactic reactions with complement fixation and histamine release as frequently seen in intravenous administration[2,4,13].

In our study, members of Group I, receiving ISG, stored for 1½ years showed allergic reactions in 48% while members of Group II receiving ISG, freshly delivered, showed reactions only in 13% (Table 1). We are inclined to interpret this difference as the *effect of storage on polymerization of gamma globulin.*

Conclusion

Based on our observations we recommend using only ISG which has been recently manufactured. If larger doses of ISG are required as in the prophylaxis against Hepatitis-B it would be helpful to administer ISG in doses of 5 ml. several weeks apart. It is hoped that hyperimmune serum globulin against hepatitis-B, which presently is being developed, will require only small doses.

References

1. Ellis EF and Henney CS: Adverse reactions following administration of human gammaglobulin. J Allergy 43:45, 1969.
2. Jager BV: Intravenous administration of modified gammaglobulin. Arch Intern Med 119:60, 1967.
3. Sumarmo: Uses and limitations of gammaglobulin therapy (Literature Review). Pediatrics Indonesia 14:174, 1974.
4. Glaser J and Wyss-Souffront DA: Alleged anaphylactic reaction to administration of human gammaglobulin. Pediatrics 28:367, 1961.

5-22. Will be found at the end of the Myers article on Tuberculosis.

Memorial

Dr. Charles D. Creevy,

Professor Emeritus and Director Emeritus,

Department of Surgery, Division of Urology,

died January 31, 1977

Dr. Charles D. Creevy, rightly considered the 'founder' of urologic surgery at the University of Minnesota died at his home on January 31, 1977 from emphysema following a courageous recovery from lung cancer surgery nine years previously. 'Don' Creevy, as he was affectionately known by generations of patients, undergraduates, and residents at the University Hospital was an example of all that is great in the long tradition of surgery at the University of Minnesota. His kindness as a physician combined with superb clinical judgment, wit and an unending contribution to building the Department of Urology as it is today, are memories that will endure.

He was a Minnesotan, graduating from the University with an M.B. degree in 1926, followed by M.D. in 1927 and a Ph.D. in 1931. In these early days urology was just beginning to be recognized as a surgical specialty, apart from general surgery, and with the encouragement of Dr. Owen Wangensteen, Dr. Creevy took further training in this fledgling specialty with a fellowship with Dr. Brasch at the Mayo Clinic, Rochester in 1930. This was followed by a fellowship under Professor von Lichenberg, the leading urologist in Europe at that time. Returning from the European experience Dr. Creevy started to build the Division of Urology so that succeeding generations of surgeons in the upper Midwest will always associate his name with the growth of this surgical specialty in Minnesota.

In those early days urology was confined to a small room in the old University Hospital and here the concept of endoscopic examination of the urinary tract was initiated, quickly leading to the modern operation of transurethral resection of the prostate, up until that time a formidable open operation with not always a favorable outcome. Over his lifetime Don Creevy perfected this technique so that in the 50's and 60's he was the most experienced transurethral resectionist in the world. Together with successive generations of residents and research fellows, his interests in this area led, in the late 40's, to a major contribution, the use of isotonic fluids during the transurethral resection of the prostate operation to avoid problems of hemolysis and renal failure, which had previously been major problems of this type of surgery. Like so many major scientific contributions the beauty of his work lay in its simplicity, in that he was able to use irrigating fluids during the operation, utilizing glucose as a principal solute to retain iso-osmolality of the absorbed irrigant, yet still permitting electrical cautery with a non-electrical conductive fluid. His original thinking in this regard was confirmed by an elegant, yet simple, method of measuring the transient changes in the patient's circulating blood sugar, proof of his theory, which resulted in a dramatic decrease in the complications of this popular operation, which is used today. Virtually all operations are now done using the basis of his studies, and as this is perhaps the most common operation for males in their later years, this work is of continuing significance.

Don Creevy was a founder member of numerous national associations, one closest to his heart being the American Association of GU Surgeons of which he was president in 1968. A similar prestigious society, the Clinical Society of GU Surgeons was another group to which he made many contributions. He was an active member of the American Urological Association, the Minneapolis Academy of Medicine, a fellow of the American College of Surgeons and the Minnesota Urological Society, and perhaps his greatest love, the former Twin City Urological Society, the progenitor of the present Minnesota Urological Society.

Under his guidance and teaching successive generations of urologists were trained to practice in the upper Midwest. He was, like so many of his generation, a stern taskmaster to his residents, a quality that must be continued in a surgical field where compulsion and attention to detail are critical for first-class results. However, this discipline was always tempered by great humanity, and not least by humility and wit, which earned him a place of affection and respect throughout American urology. His pursuit of excellence and ability to see clearly new surgical methods of significance guided his many contributions in the last ten years of his life, where he published many "overview articles" on recent developments in the art and science of urology, still serving as hallmarks of creative criticism and experience.

During his over 30 years as the Director of the Division of Urology he cared for innumerable members of the University faculty and served as the final consultant in patients from far and wide. Such a position, that of being a 'doctor's doctor' was commensurate with his stature and amongst his patients over the years he numbered leaders in American urology who came to Minnesota for his superb clinical judgment and care. In later years he encouraged many younger people to pursue academic careers and with Dr. Milton Reiser as his associate for many years, was one of the first people to initiate the use of an artificial kidney prior to renal transplantation.

On a personal note, Don Creevy was a quiet, likeable man whose example will always remain hard to equal. His hobbies were simple, with summer vacations spent at his cottage on Cass Lake, enhanced by his expertise in all aspects of photography. He was especially and rightfully proud of his photographic skill. A feature of his writings and lectures were the illustrations he prepared himself prior to the development of Medical Biographics.

His ability as a speaker with experience, originality and humor was outstanding and he made many contributions to such national activities, even though travel in those days was a slow progress. He never accepted the pace and frenetic travel of today, and his abhorrence of air travel was a reminder that might well not be forgotten, as the scientific community spends more and more time traveling immense distances, for oftimes a less productive return.

In 1968 Don Creevy retired, rejoining Dr. Baxter Smith and former associates in the community where he continued to practice with the same devotion and high standards that had characterized his career.

Unfortunately, about that time he required surgery for lung cancer which, though successful, left him with limitations imposed by chronic emphysema. The last few years of suffering meant he was confined to his home, where the devotion of his wife, Alice, made these last few years worthwhile, as he continued to write and contribute to urology. He is survived by two sons, one of whom carries on the family name in obstetrics, the other in commerce.

His passing ends an historic era as urology has developed into a field encompassing fields far beyond his early days. It was his leadership and guidance that made this growth possible, a contribution which American Urology must never forget. C.M.

1977 MSMA Socio-Economic Conference

MSMA President, Chester A. Anderson, M.D., has announced the dates of November 17-18 for the 1977 MSMA Socio-Economic Conference. The meeting is scheduled for the Radisson South Hotel in Bloomington—the same hotel reserved for the November 18-19, 1977 Interim Session of the MSMA House of Delegates which follows the Conference.

The Conference is geared for physician leadership in all parts of Minnesota. It is planned to zero in on priority socio-economic topics of high interest to physicians. Specific and detailed attention will be given to health planning, legislation (state and national), third party relationships, health care costs, medical discipline, continuing medical education and medical professional liability.

The one and a half day Conference is scheduled to begin at 10:00 a.m. on Thursday, November 17 and conclude at noon on Friday, November 18, just prior to the opening session of the MSMA House of Delegates.

A special mailing will be directed to all MSMA members inviting their attendance at this important meeting in November.

Entrance, Rise and Fall of Tuberculosis in Minnesota

J. ARTHUR MYERS, M.D.*

THERE IS NO SOUND EVIDENCE that tuberculosis existed in the area which became the United States prior to the arrival of Caucasians. The first white men to appear in the area later named Minnesota were two Frenchmen—Medart Chouart des Groseilliers and his brother-in-law, Pierre Radisson. As explorers and fur traders they beached at Knife Lake in 1659, in the area which later was named Kanabec County. There they dealt intimately with American Indians. At that time tuberculosis was prevalent in France. During the next 100 years North America was under the French Crown and many Frenchmen came to this area, including Duluth, Fontenac, Father Hennepin, Mankato, Nicollet, La Salle and Le Sueur. If the first white men of 1659 did not leave tubercle bacilli it could not have been long until others transmitted them to Indians. In 1834, Samuel Pond and in 1846, Dr. T. S. Williamson observed a great deal of tuberculosis among the Indians around Lake Calhoun and LacQui Parle, respectively.

1849

On March 3, 1849, when Minnesota was declared a territory, there were only 5,000 Caucasians here. Soon they began to offer numerous inducements to persons in the New England states and Europe, particularly Scandinavian nations, to come to Minnesota. Climate was one of the inducements. Word was spread that there was an elixir in the air that would cure consumption. Soon many arrived from New England, Scandinavia, Germany and Ireland. Large numbers came in the 1850's, more in the 1860's and 1870's until there was a great hegira of invalids in the state. They represented many walks of life, from the very poor to the well to do; most of them, including Henry David Thoreau and Edward L. Trudeau, were ambulatory. They resided in hotels, boarding houses, private homes and mingled freely with the permanent residents in public places. The Consumptives and others brought cattle with them, of which there were 245,545 in 1880. Tuberculosis was prevalent among them. Thus, a most serious tuberculosis problem had been created, the solution of which would require more than a century.

The solution of the problem consisted of preventing infection of infants, children and youths, and creating a situation whereby they could live their entire lives uninfected.

Organization of Minnesota State Medical Association

In 1867 Dr. Charles N. Hewitt of Geneva, New York, began the practice of medicine in Red Wing (named for Indian Chief Red Wing). In 1869 he and some of the 212 physicians, 119 regular (well-qualified), and 93 irregular, organized the Minnesota State Medical Association. Three years later, Dr. Hewitt was instrumental in having the Legislature pass a law providing for a State Board of Health. At the first meeting of the Board he was elected secretary. In the first annual report he wrote, "The special questions suggested by our work, and which demand immediate and careful study are: the number of sufferers from all forms of scrofulous disease who come to Minnesota for prevention and cure, their condition on coming here, and the effect of climate, etc., upon the disease . . ."

Mayo Address in 1873

In his presidential address before the Minnesota State Medical Association in 1873, Dr. William Worrell Mayo said, "The profession of this state, above all others, should be able to contribute some facts which would go far toward solving the mysteries of lung diseases. Our state has become a large suburban hospital, receiving from every State of the Union invalids who are seeking relief from that fell destroyer, consumption, upon this subject at least we must furnish our quota of facts. Statistics also make an unfavorable showing in the death rates from consumption, but this is only apparent for many in the last stages, who came to this State as a final resort, after all other hopes have failed."

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In 1894, as president of the State Medical Association, Dr. William James Mayo appointed the first committee on tuberculosis of the Association with Dr. R. O. Beard as chairman. That committee's report in 1895 contained excellent recommendations regarding control of tuberculosis in both people and animals.

Story of Sanatoriums

The idea of public sanatoriums was broached by Dr. L. A. Nippert of Minneapolis in 1892. When Dr. H. Longstreet Taylor of Nashville, North Carolina established a private practice in St. Paul in 1893, he promptly published an article entitled, "The Necessity of Special Institutes for the Consumptive Poor". He believed that by nursing and medical care in sanatoriums, many patients would be restored to useful citizenship, and segregation would protect the healthy from the likelihood of infection.

In 1903 a sanatorium commission consisting of 3 physicians recommended the building of a sanatorium near Walker. That institution opened in December, 1907, with a capacity for 60 patients. Dr. E. L. Tuohy of Duluth was instrumental in having county sanatoriums established, the first of which named Nopeming, located near Duluth, opened for 50 patients in 1912. By 1918 there were one state, 14 county, one municipal and two private sanatoriums in Minnesota with a total of 685 beds.

In 1927, when Veterans Hospital was opened, buildings 5, 6 and 7 were for tuberculous veterans. For sometime thereafter, from 150 to 200 beds were occupied. The total bed capacity in state and county sanatoriums had been increased to 2,084 in 1946. Up to 1948 more than 200 physicians had served one year or more on sanatorium staffs. From 1908 to 1948 there had been 43,864 admissions of which 7,446 were readmissions to the state and county sanatoriums. In those institutions 11,264 patients died. Isolation of patients in sanatoriums played a large role in decreasing infection in their home communities. Those patients with hopelessly advanced disease were kept isolated until death, and the much larger number who recovered were rendered noncontagious before discharge. Therefore, fewer and fewer clinical cases developed.

By 1946 sanatoriums had 500 vacant beds rather than the long waiting lists of patients in previous years. In fact, the two private and the municipal sanatoriums had closed, and in 1946 plans were being considered for closure of some of the smaller ones. By 1968 all sanatoriums had been closed, except Glen Lake State Sanatorium which now has less than 20 tuberculous patients.

Nature of Tuberculosis

Sanatoriums were built not only to prevent contagion in the patients' home communities but also for treatment of early cases. However, when patients arrived, 80 per cent or more had the disease in an advanced stage. They were criticized for not having been examined when symptoms first appeared. Moreover, practicing physicians were blamed for not making early diagnoses. However, it was learned that the lungs contain no sensory pain nerve fibers. Thus, extensive disease resulted in no pain. It was also learned that the lungs have capacity for approximately eight times more air than is inhaled with each breath. Therefore, extensive disease developed before shortness of breath occurred. Also, in 80 per cent or more, cough with expectoration does not appear until the disease has advanced through the minimal stage. When periodic x-ray film inspection was made of adult tuberculin reactors, in those destined to develop clinical disease, shadows of small evolving lesions appeared and gradually increased for two or more years before the patients had symptoms.

Early Treatment

In the early years sanatorium treatment consisted mostly of bed rest, adequate diet and as much outside air as possible. In 1899 Dr. H. Longstreet Taylor of St. Paul administered the first artificial pneumothorax in the state. It was later in extensive use in sanatoriums, general hospitals and physicians' offices. In 1972 Dr. T. J. Kinsella of Minneapolis, after performing pneumothorax frequently for 40 years, wrote: "The value of pneumothorax treatment has been amply demonstrated by the extent of its use (up to 50 per cent of patients) in some large institutions and the thousands of patients who recovered from tuberculosis because of it." Extrapleural thorocoplasty for tuberculosis was first performed in Minnesota by Dr. Carl Hedbloom of the Mayo Clinic in 1919. It was soon in extensive use for lungs that could not be adequately collapsed by pneumothorax because of adhesions. When in the late 1930's and 1940's sulfa drugs, penicillin and streptomycin became available, pneumonectomy, labectomy and segmentectomy were successfully performed. With the availability of more drugs, including para-aminosalicylic acid, isoniazid, ethambutal and riphampin, drug therapy became so effective, even in advanced cases that surgery was rarely necessary.

In 1902 The Young Men's Club of Minneapolis appointed Drs. Lester Day, Henry Ulrich and Marx White as members of the first medical committee to study tuberculosis and its needs with reference to organization. Soon Dr. H. M. Bracken of the State Board of Health appointed Dr. Ulrich chairman of a committee which arranged for the first free clinic in the state for the tuberculous poor at the University of Minnesota in 1903. Soon similar clinics were established in other cities.

Minnesota Association for Prevention and Relief of Tuberculosis

The Minnesota Association for Prevention and Relief of Tuberculosis (later Tuberculosis and Health Association) was organized with headquarters in St. Paul in 1906. The membership was composed of laymen and physicians. Dr. E. A. Meyerding of St. Paul served as executive secretary and managing director from 1924 to 1958. A component organization was established in each county which worked in close cooperation with the State Association. A monthly tuberculosis magazine was mailed to all schools of the state, physicians and many others. The Association introduced health education into the schools, conducted the Tuberculosis Christmas Seal Sale, promoted a state-wide tuberculin testing of children program, and had the first county in the nation certified for tuberculosis control work in progress by the American School Health Association. For the State Association one physician administered the tuberculin test more than 2,000,000 times to school children and personnel. Many other educational activities were conducted. Thus, the Association reached the citizens of every nook and cranny of the state.

Peak of Tuberculosis

Tuberculosis reached its peak of destructiveness in 1911 when physicians reported 2,522 deaths, and 5,280 cases were reported in 1916. That year Dr. J. P. Sedgewick, Chief of the recently established department of Pediatrics at the University of Minnesota, wrote that 70 per cent of children of 14 years were infected with tubercle bacilli. Dr. A. J. Chesley in 1920 wrote that there were 100,000 tuberculous cattle in the state. Some of those animals were eliminating bovine species of tubercle bacilli which also infected people. It is doubtful whether any human adult escaped infection. With so few sanatorium beds available, most patients still remained in their home communities where many were disseminating tubercle bacilli. Some were admitted to general hospitals after becoming totally incapacitated. Isolation of patients in sanatoriums and general hospitals was the beginning of the program which resulted in the downfall of tuberculosis.

First Tuberculosis Clinic at University

Dr. John Sundwall, in 1920, established at the University of Minnesota the first tuberculosis clinic among Student Health Services in this country. He appointed a medical staff charged with control of the disease among personnel and students and to study evolution of the disease among students. All students were tested with tuberculin on admission to the University in 1928 when 33 percent reacted. Thereafter, all entering students were tested and x-ray film inspection was made of the tuberculin reactors. The most serious tuberculosis problem was found among students of nursing and medicine, approximately two thirds of whom were uninfected on entrance to school. They later had contact with tuberculous patients in a sanatorium and in general hospitals. There, a high percentage of the previously uninfected became infected.

In 1937 Dean Harold S. Diehl required that the sanatorium teaching service be discontinued and students taught on a general hospital tuberculosis service where contagious disease technique was practiced. Among the medical school classes from 1919 to 1932, 92 (7.0 per cent) developed clinical tuberculosis while in school or soon after graduation and 11 died. No medical student has developed clinical tuberculosis since 1946. Moreover, it has become rare for a student to become infected.

Outpatient Clinic for Children

As Commissioner of Health of Minneapolis in

1921, Dr. F. E. Harrington established a school and outpatient clinic for tuberculous children. He appointed a medical staff of more than 20 members who volunteered their time and work, not only for those children who needed medical care but also to make an exhaustive study of tuberculosis among children from the time first infection occurred on to the various clinical forms of the disease. Over the next 13 years more than 19,000 children registered in the clinic, many of whom were recent tuberculin converters. A number of facts were established by 1940. For example, the safety of the tuberculin test was demonstrated; only a small percentage of recently infected infants and children develop meningitis or miliary disease; chronic pulmonary disease rarely develops before the age of 12 years; periodic x-ray film inspection of chests of tuberculin reactors reveals chronic pulmonary lesions, two or more years before symptoms appear or the disease becomes contagious; chronic pulmonary disease usually appears only among those who have been infected for years or decades and clinical tuberculosis, both acute and chronic, is due to endogenous reinfections.

Tuberculosis and Milk

Late in the 1890's pasteurization of milk was strongly recommended and soon became compulsory to protect people against *M. bovis*. In 1894 Dr. Hewitt of the State Board of Health employed Charles E. Cotton, D.V.M., to tuberculin test all cattle in the vicinity of Minneapolis. Soon thereafter, an ordinance was enacted to the effect that no person could be licensed to sell milk in that city until his cattle had been tested and the reactors removed. That was the first such ordinance to be adopted in the United States.

The Minnesota State Livestock Sanitary Board began a state-wide tuberculin testing of cattle program county by county in 1923. The standard procedure was to slaughter all tuberculin reactors. By 1948 the tuberculin test had been administered 23,160,923 times and the 255,944 reactors slaughtered. The percent of reactors had dropped from 10.90 in some areas in 1905-06 to 0.90. On March 1, 1976, the Veterinary Division of the United States Department of Agriculture informed Dr. J. G. Flint, secretary and executive officer of the State Livestock Sanitary Board, that Minnesota has qualified as a bovine tuberculosis free area. Among the 4,000,000 cattle, none had been found to have tuberculosis for five years.

For a few years after the Gillette State Hospital for Crippled Children was opened in St. Paul in 1913, 50 percent of the admissions had tuberculosis; many were due to *M. bovis*. By 1948 that percentage had been reduced to 6 and on to less than 1 percent in 1957. No new case has been reported for several years. The veterinarians' program was supported to the nth degree by the medical profession and many physicians participated in their educational campaign.

Public Health Committee

A Public Health Committee, of which one member was responsible for tuberculosis activities, was appointed by the State Medical Association in 1924. A decade later that committee, with Dr. E. L. Tuohy of Duluth as chairman, organized subcommittees of which one was assigned to tuberculosis. That subcommittee held eight monthly meetings annually. In 1940 Dr. C. A. Stewart of Minneapolis, a member of the Council of the State Medical Association, proposed that the subcommittee develop a state-wide tuberculosis control program. The subcommittee decided that the diagnostic and management procedures consist of tuberculin testing as many persons as possible and making x-ray film inspection of the chests of adult reactors with complete clinical and laboratory examinations of those showing shadows of lesions which might prove to be tuberculous. For tuberculin reactors 12 years or older, annual inspection of the chest by x-ray film was recommended. All non-reactors to tuberculosis should have the test repeated every two or three years. The final recommendation was that arrangements be made for medical and sanatorium care for active cases of tuberculosis.

In cooperation with the Meeker County Medical Society, that county was chosen as a demonstration area. The members of the Medical Society of the county, of whom Dr. Karl Danielson was chairman, did the tuberculin testing, x-ray work and appropriate management of clinical cases as a public service. The demonstration was so successful that other counties followed.

State Medical Association Committee

As president of the Minnesota State Medical Association in 1941, Dr. B. J. Branton of Willmar recommended that the subcommittee be made an independent scientific committee. From 1934 to 1948, 40 physicians from various parts of the state served on the subcommittee or the committee. Drs. W. H. Feldman, H. C. Hinshaw and K. H. Pfuetze were members during the years they were studying antituberculosis drugs, including promin and streptomycin They kept the other members informed each month concerning their achievements. Over the years the committee recommended to the Council of the State Medical Association numerous projects. For example, that a committee on tuberculosis be appointed by each of the 34 County and District Medical Societies to become self-sufficient in the tuberculosis control program in the areas they served. When that was accomplished Minnesota was the first state so organized in the nation.

The Committee promoted the program of Dr. H. A. Burns, Chief of the Tuberculosis Control Unit in the Division of State Institutions, in the solution of an extremely serious tuberculosis problem among patients and personnel in institutions for the mentally ill. In those institutions the tuberculosis mortality rate was 858.6 per 100,000 population in 1940, but was reduced to 65.9 in 1961.

Tuberculosis and American Indians

Tuberculosis had long been destructive among American Indians. Little had been done to control it until Drs. H. A. Burns and Albert Chesley succeeded in having a building with 117 beds for Indians constructed on the State Sanatorium grounds in 1934. Soon the control program which had been so effective among Caucasians was in vogue among Indians with excellent accomplishments. The mortality rate of 529.2 per 100,000 in 1937 decreased to 143.7 in 1948 and to 6.5 in 1964 with corresponding decreases of infection and case rates. The problem among Indians has been reduced to approximately the same level as among Caucasians.

MINNESOTA MEDICINE Manuscript

In order that every physician might have available the recommendations of the Committee for a state-wide tuberculosis control program, the Committee members prepared a manuscript entitled, "An Ideal Tuberculosis Case Finding Program," which was published in MINNESOTA MEDICINE in August, 1946.

Thus, since the beginning of the attack on tuberculosis by the medical profession and allies accomplishments have been phenomenal. They were first observed among infants and young children who had been protected against *M. tuberculosis* and *M. bovis*. For example, among infants the mortality rate decreased from 107.2 per 100,000 in 1918 to 27.3 in 1930 and 10.9 in 1940. Tuberculous meningitis and miliary diseases were prevalent and universally fatal among infants and young children during the first three decades of this century. However, only nine cases were reported from 1960 to 1975, of whom four died. As uninfected children passed on from year to year, they replaced those who had been infected and were growing older as potential cases of clinical tuberculosis. That continued to occur until most of the extensively infected group in early life had become old and many had died.

In 1938 Dr. F. L. Jennings of the Glen Lake Sanatorium apparently was first to call attention to the marked change in age of patients admitted to the sanatorium. In the early years a preponderance of admissions were young people, but by 1936 more admissions were 45 years or older. That increase of disease among old people continued until a high percentage of sanatorium admissions were old.

The number of reported deaths from tuberculosis among people of all ages decreased from 2522 (rate 119.7) in 1911 to 331 (rate 11.1) in 1950 and to 29 (rate 0.7) in 1975. The number of cases decreased from 5280 in 1916 to 950 in 1960 and 194 in 1975.

Present Problems

Although the above accomplishments have been attained, a significant tuberculosis problem still exists in Minnesota. The number of reported cases per year has decreased very slightly during the past few years. Group tuberculin testing of people of all ages in 65 counties in 1967 revealed that among those from birth to 14 years, 0.4 per cent reacted and among those from 20 to 49 years, 3.43 reacted. However, among older people of 50 to 59 years, 6.03 and those of 60 years and over, 10.35 per cent reacted. About 5 to 10 per cent of those reactors may be expected to develop clinical tuberculosis.

In the early years of the antituberculosis drug era it was hoped that administration of drugs, particularly isoniazid, to persons who were only tuberculin reactors would destroy all tubercle bacilli. However, evidence has accrued to show that if isoniazid is administered within three months after infection occurs tubercle bacilli are presumably killed as manifested by reversion of the tuberculin reaction. Among infections of six months and those of 12 months before drug administration, 87 per cent and 64 per cent respectively have tuberculin reaction reversion. Among those whose infection occurs more than one year before drug administration, none have tuberculin reversion. It had long been known that primary tuberculous lesions become so encapsulated as to be avascular after which drugs in the blood stream cannot reach them.

The tuberculin test has been the mainstay in Minnesota's tuberculosis control program. When a person reacted to the test two important facts were established. First, living tubercle bacilli had taken refuge in his body; therefore, he was a potential case of endogenous reinfection clinical tuberculosis. Second, the reactor had been in contact with a person, usually an adult, who had contagious tuberculosis. A search among his adult associates often located that person. If tuberculosis is to be eradicated from Minnesota, all tubercle bacilli must be found by the tuberculin test and dealt with accordingly.

References

Adverse Reaction to Large Doses of Human ISG—Bruhl (page 676).

5. Kamme C, Coster C et al.: Side effects of treatment of hypogammaglobulinemia with gammaglobulin. Acta Med Scand 179:679, 1966.
6. Henney CS and Ellis EF: Antibody production to aggregated human gammaglobulin in acquired hypogammaglobulinemia. New Engl J Med 278:1144, 1968.
7. Kleinman PK and Weksler ME: Repeated reactions following intramuscular injection of gammaglobulin. J Pediatrics 83:827, 1973.
8. Redeker AG, Mosloy JD, Gocke DJ et al.: Hepatitis-B immuneglobulin as a prophylactic measure for spouses exposed to Acute type B Hepatitis. New Engl J Med 293:1055, 1975.
9. A Cooperative Study: Prophylactic gammaglobulin for prevention of endemic hepatitis. Effects of U.S. Gammaglobulin upon the incidence of viral hepatitis and other infectious diseases in U.S. soldiers abroad. Arch Intern Med 128:723, 1971.
10. Ginsberg AL, Conrad ME et al.: Prevention of endemic HAA-positive hepatitis with gammaglobulin. Use of a simple radio-immune assay to detect HAA. New Engl J Med 286:562, 1972.
11. Szmuness W, Prince A et al.: Hepatitis-B immune serum globulin in prevention of non-parenterally transmitted Hepatitis-B. New Engl J Med 290:701, 1974.
12. Redeker A, Mosley JW et al.: Hepatitis B Immune Globulin as a prophylactic measure for spouses exposed to acute Type B Hepatitis. New Engl J Med 293:1055, 1975.
13. Barandum S, Kistler J et al.: Intravenous administration of human gamma-globulin. Vox Sang 7:157, 1962.
14. MacKenzie DL, Vlahcevig ZR: Adverse reaction to gammaglobulin due to hypersensitivity to Thimerosal. New Engl J Med 290:748, 1974.
15. Fudenberg HH: Sensitization to Immunoglobulins and Hazards of Gamma Globulin Therapy, in "Immunoglobulins," Biological Aspects and Clinical Uses, National Academy of Sciences, Washington, D.C. p. 211, 1970.
16. Christian CL: Characterization of the "reactant" gammaglobulin factor in the F.11 precipitation reaction. J Exp Med 108:139, 1958.
17. Ishizaka T and Ishizaka K: Biological activity of aggregated gamma-globulin 1. Skin reactive and complement fixing properties of heat denaturated gamma-globulin. Proc Soc exp Biol (NY) 101:845, 1959.
18. Ishizaka K and Ishizaka T: Biological activity of aggregated gamma-globulin. II. A study of various methods for aggregation and species differences. J Immunol 85:163, 1960.
19. Ishizaka K, Ishizaka T and Sugahara T: Biological activity of aggregated gamma-globulin. III. Production of Arthus-like reactions. J Immunol 86:220, 1961.
20. Caldera LH, Ropars C et al.: Anticorps anti-immunoglobulines chez les sujets attaints de déficit immunitaire. Rev Franc de Transfusion T. XVI, 393, 1973.
21. Gross PA, Gitlin D, Janeway CA: The Gammaglobulins and their clinical significance IV. New Engl J Med 260:170, 1959.
22. Crain JD, Rosen FS, Janeway CA: Clinical experience with intravenous fragmented gammaglobulins, in "Immunoglobulins." Biological Aspects and Clinical Uses, Nat. Academy of Sciences, Washington, D.C. p. 179, 1970.

Fracture Conference

Long-Bone Fractures
Application of Biomechanical Principles in Surgical Treatment

EDMUND Y. S. CHAO, Ph.D.;* FRANK C. HUI, M.D.;† and
KENNETH A. JOHNSON, M.D.‡

Dr. Edmund Y. S. Chao:

Wider acceptance of open reduction and internal fixation for long-bone fractures has evolved during the past several years primarily because of the influence of the Internal Fixation Study Group in Switzerland. This conference is aimed to show how some of the principles of biomechanics can be applied to realistic problems in open fracture treatment.

Case 1

Dr. Frank C. Hui:

A 24-year-old man fractured his distal right femur in a motor vehicle accident. He had no other injury. Dr. Landon, assuming that you want to proceed with operative management, what kind of internal fixation device would you use?

Dr. Glenn C. Landon:

This fracture (Figures 1 A and B) is too distal for the use of an intermedullary rod, so I would prefer a plate fixation device.

Dr. Hui:

At operation, the fracture was anatomically reduced, and a 10-hole Vitallium compression plate was applied (Figure 1 C). The fracture eventually healed without any problem.

Dr. Chao:

Dr. Lipscomb, if you used a plate for femur fixation, where would you place it?

Dr. Paul R. Lipscomb, Jr.:

On the convex tension side of the bone, which would be anterior and lateral for the femur.

Dr. Chao:

There are a few important biomechanical considerations with regard to plate fixation of the femur. First, the use of a single plate on the tension side with sufficient medial cortical support can sustain the *same* amount of bending moment as if a plate with five to six times of thickness were applied on the wrong side (Figure 2).

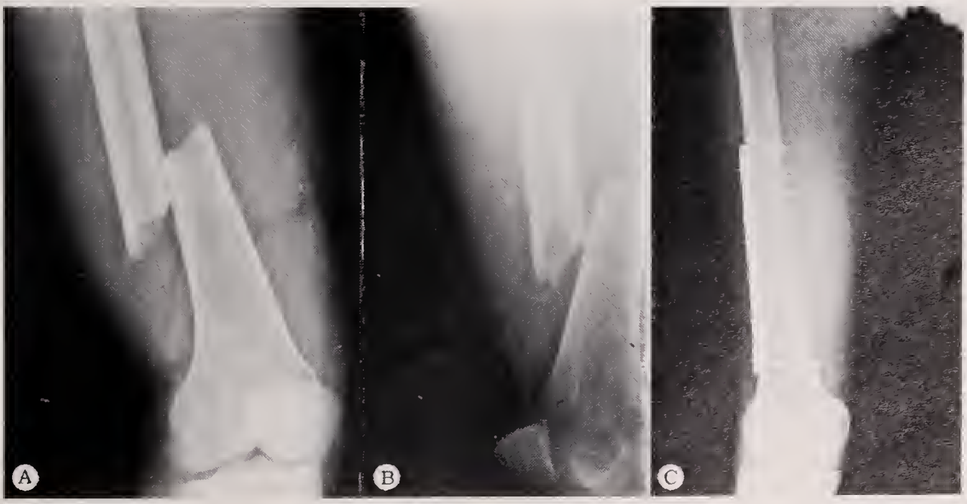

Fig. 1 (Case 1)—A 24-year-old man with fracture of right femur. (A) Preoperative anteroposterior view. (B) Preoperative lateral view. (C) Postoperative.

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Fracture Conference, April 14, 1976.

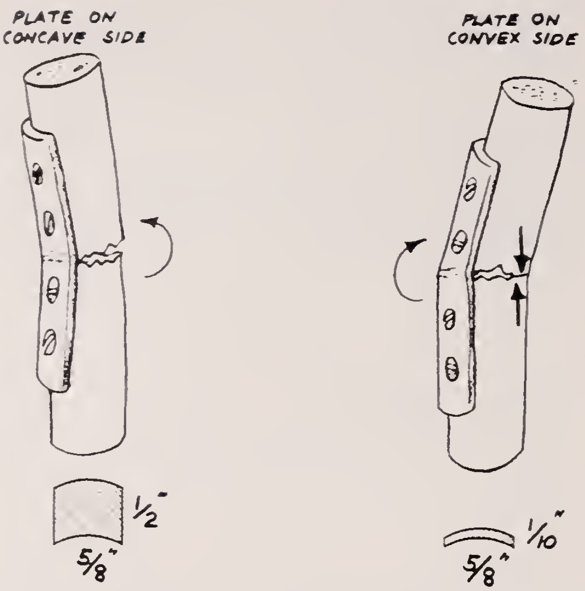

Fig. 2—Effect of loading configuration. Use of a single plate on tension side, with sufficient medial cortical support, can sustain the same amount of bending moment as compared with a plate that is five to six times thicker but applied on the wrong side (compression side).

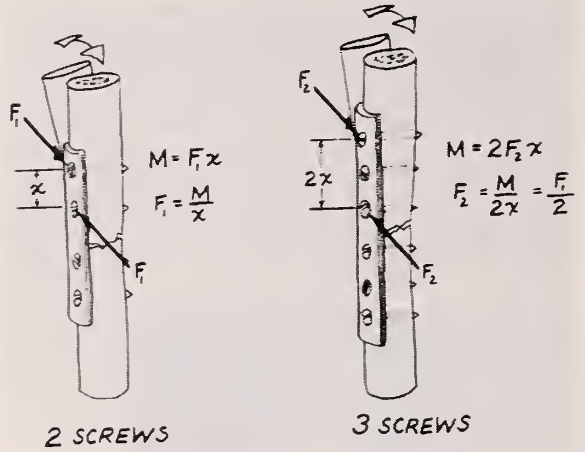

Fig. 3—For the same amount of bending moment applied to the system, the addition of one more screw will decrease the force on the screws by half (assuming that the middle screw does not take any bending load).

Sometimes the number of screws is very important because fixation failures are not always caused by the fracture of the plate. The screws may fracture or loosen. A longer plate uses more screws to share the load passing through the fracture site. Such management will also place the load-bearing screws farther away from the fracture site. Simple mathematical calculations will show us that the force acting on a screw will decrease as its distance from the fracture site increases, when a constant torque is applied to the system (Figure 3).

Case 2

Dr. Hui:

A 77-year-old woman fell and sustained a closed fracture of her right femur (Figure 4 A). She was treated with traction for 12 weeks, followed by immobilization in a spica cast for four weeks. Because the fracture did not unite, she was then transferred to our clinic.

Initially, she was treated here with a cast brace for two months. However, she continued to have pain as well as gross motion at the fracture site. At this point, operative intervention was considered necessary. Dr. Crouse, how would you treat this fracture?

Dr. James E. Crouse:

I think that the patient would be a good candidate for an intermedullary nail with bone grafting.

Dr. Hui:

A nail would probably be acceptable, but instead a plate was chosen as a fixation device. The cortical nuts were necessary because the medial cortex was eggshell thin and the screws could not firmly engage the medial cortex without the nuts (Figure 4 B). A bone graft was applied to the fracture site at the same time. At six months, some bone resorption was noted at the end of the fracture fragments, and a lack of medial cortical support was evident. At 15 months postoperatively, while using a walker, she slipped. She felt a severe pain in her left thigh. A fracture of the plate occurred (Figure 4 C).

Dr. Chao:

Case 2 may be analyzed mathematically by making a free-body diagram of the femur and the fixation apparatus. It is assumed that the force on the femoral head is equal to body weight (50 kg in this case). This is a rather conservative assumption since studies have shown that the force

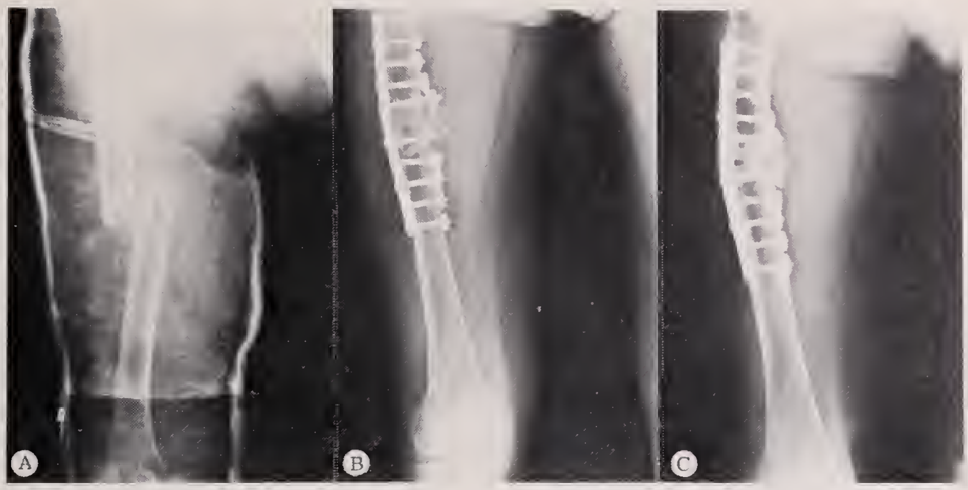

Fig. 4 (Case 2).—A 77-year-old woman with right femoral fracture. (A) Preoperative. (B) and (C) After plate fixation. Fracture of plate at screw hole near fracture site (C).

on the femoral head would be more than body weight when one merely lifts a leg. The moment arm as measured from the roentgenogram is five cm, and therefore, the bending moment becomes 250 kg. The calculated stress at the plate will be 6,250 kg/cm^2 or 88,710 psi (Figure 5). Note that we assume no medial cortical support in this calculation.

This plate is made of Vitallium that has an ultimate tensile stress of 105,000 psi. Two factors should be considered in estimating the maximal stress in the plate. The first factor involves the stress concentration factor (or stress raiser) at the screw holes. This factor is usually larger than one, which represents a magnification of stress due to abrupt change of specimen geometry. For these plates, the stress will be magnified by 1.5 times. The other factor involves fatigue. If the plate is to last 25,000 cycles of loading, the maximal stress should not exceed 70,000 psi. This is not even considering stress concentration. Thus, it is not difficult to predict that the plate would eventually fracture. Also we would expect that the fracture should occur at the screw hole where the stress is maximum.

If we want to change the size of the plate in order to bear the maximal stress as calculated, then we should increase the *thickness* of the plate. The maximal stress capacity of the plate is increased by 36 and 56% if we increase the thickness of the plate by one and two mm, respectively. Increasing the *width* of the plate is not as effective because an increase in width of two mm increases the plate stress capacity by only 17%.

A few questions are often asked in regard to plate fixation of fractures of the long bone. One of these is whether compression is necessary. A well-applied compression will give a more rigid fixation than without compression, at least during the immediate postoperative period. Factors such as muscular forces, bone remodelling, weight-bearing, and overcompression also need to be evaluated.[1-4] Thus, the question whether or not compression would be beneficial is not easy to answer.

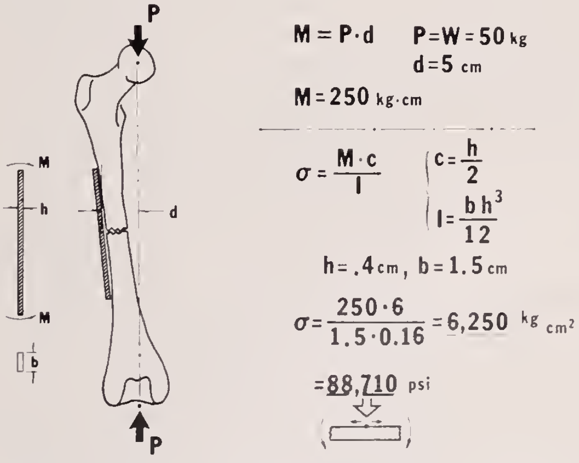

Fig. 5—Free-body diagram of femur and fixation apparatus. Assuming that force on femoral head is equal to body weight (50 kg) and taking anthropomorphic measurement from the patient, the calculated stress on the pate is 6,250 kg/cm^2 (88,710 psi) if no medial cortical support is present. (σ is the tensile stress, c is distance of the most superior fiber of the plate to the neutral axis, and I is the area moment of inertia of the plate cross-section.)

The second question concerns the removal of the plates and the timing of the removal. Localized osteoporosis invariably occurs at the plated segment of bone after removal of the plate. Such deficiency in bone strength probably is due to the segment of bone being protected from physiologic stress by plating. From an engineering standpoint, if two or more components with different bending stiffness are combined to form one mechanical system, the stress in the element with lower stiffness will be reduced significantly. When a load is imposed on such a system, the component with the highest stiffness bears more of the load and thus protects the other component. Stainless steel and Vitallium plates have bending stiffness values that are much higher than those of bone and thus the protection effect to the bone will be substantial. The amount of osteoporosis is somewhat time-dependent, although the exact temporal profile has not been worked out in detail. Thus, from a purely mechanical standpoint, plates used for internal fixation of fractures should be removed after the fracture is healed. However, there is no scientific way to decide on the ultimate time of removal. Some clinicians do it empirically between nine and 18 months after the operation. Results from work on plates that have lower bending stiffness[5] may make removal of plates less mandatory because the localized osteoporosis would not be so severe.

A number of groups are engaged in developing noninvasive techniques that can estimate the quality of bone healing at the fracture site in vivo. These techniques may help determine the optimal timing for implant removal. In any event, proper protection after plate removal should always be emphasized.

References

1. Hutzschenreuter P, Perren SM, Steinemann S: Some effects of rigidity of internal fixation on the healing pattern of osteomies. Injury 1:77, 1969.
2. Lindahl O: The rigidity of fracture immobilization with plates. Acta Orthop Scand 38:101, 1967.
3. Perren SM, Huggler A, Russenberger M, et al.: The reaction of cortical bone to compression. Acta Orthop Scand Suppl 125:19, 1969.
4. Wirth CR, Campbell CJ, Askew MJ, et al.: The biomechanical effects of compression plates applied to fractures. J Trauma 14:563, 1974.
5. Woo SL, Akeson WH, Coutts RD, et al.: A comparison of cortical bone atrophy secondary to fixation with plates with large differences in bending stiffness. J Bone Joint Surg [Am] 58:190, 1976.

Continuing Medical Education

University of Minnesota

Family Practice Review and Update—1977

An intensive, comprehensive review of Family Medicine will be presented September 26-30 at the St. Paul Radisson Hotel.

This annual, five-day course is designed to meet the needs of physicians preparing for certification or recertification in family practice, or those wishing a comprehensive general review. All major fields of medicine and surgery are presented in a systematic manner.

More than 200 registrations have been received so far; attendance limit will be filled quickly. Early registration is advised. A deposit of $50.00 will assure your place in this course. The full fee is $245.00.

The Symposium will be approved for approximately 40 prescribed hours by the AAFP and AMA Category 1 credit.

Contact: Office of Continuing Medical Education, Box 293, Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, Minnesota 55455, (telephone: 612/373-8012).

FDA Regulations on Hearing Aid Devices

August 15, 1977, the Food and Drug Administration (FDA) regulations for labeling of hearing aids and conditions for their sale become operative. These new rules and regulations will vitally affect the way in which hearing aid dispensers and manufacturers conduct their business.

"Dispenser" refers to anyone who dispenses (sale, lease or rental) a hearing aid to a member of the consuming public. The new rules and regulations apply equally to any dispenser—the hearing aid specialist, the audiologist or the doctor.

As a condition of sale any person with hearing impairment must obtain a medical evaluation from a physician, preferably an ear specialist, before buying a hearing aid.

One of the major reasons for adoption of this new medical evaluation rule was that the Commissioner agreed with the American Council of Otolaryngology (ACO), statement in that association's comments that the recognition of an organic cause for hearing impairment is of extreme importance to the health and safety of the hearing impaired patient. The Council pointed out that some of the causes for sensorineural hearing loss include conditions such as brain tumor, syphilis, endocrine disorders, collagen diseases and endolymphatic hydrops.

The final rule requires that as a condition for sale, a person must have obtained the medical evaluation within the preceding six months prior to the sale of a hearing aid. The medical evaluation requirement does not require the physician to prescribe, recommend or certify that a patient may be *helped* by a hearing aid. The provision simply requires that a physician provide the patient with a written statement indicating that the patient's hearing loss has been medically evaluated and interpreted and that the patient may be considered a candidate for a hearing aid.

It is very important to note that the requirement for medical evaluation applies to everyone, whether or not they are currently using a hearing aid.

Hearing aid dispensers must provide a wide variety of necessary services to prospective hearing aid users.

There is a provision for a waiver of the medical evaluation.

The waiver is permitted only for those over the age of 18 and only where the dispenser finds that *none* of the following conditions exist:

"Visible congenital or traumatic deformity of the ear;

History of active drainage from the ear within the previous 90 days;

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Abstracted from an article by Ron Reichart: As I See it. Hearing Instruments, page 18, April, 1977. (By permission.)

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(continued to page 696)

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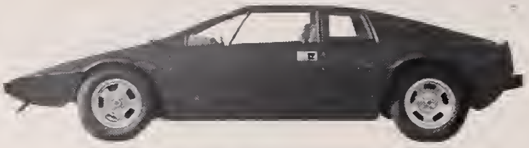

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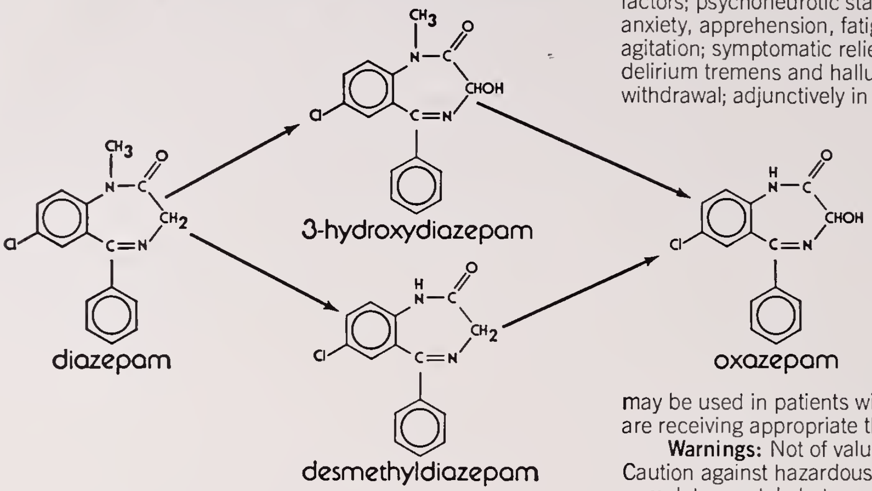

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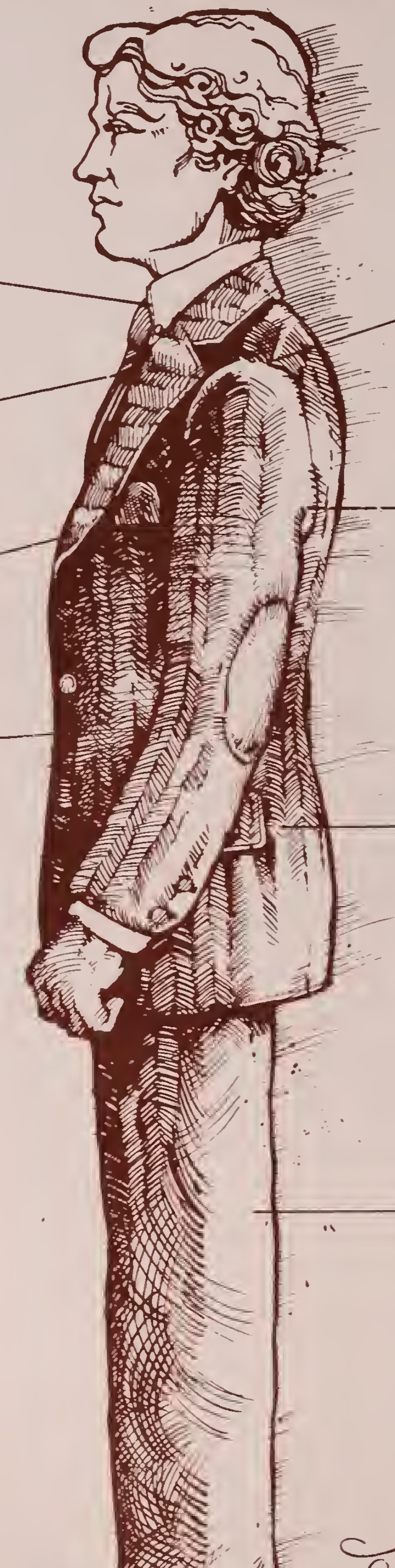

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President's Letter

Membership—Why Me?

I feel somewhat like the preacher who is admonishing his congregation to stay on the straight and narrow—the fact that they are in church already means they are trying and the words are perhaps falling on the wrong ears. Your reading this probably means that you are a member of MSMA and are thus receiving MINNESOTA MEDICINE. But on the chance that this may be picked up by some practicing physician who is not a member, or a resident, or a student who has not yet joined the Minnesota State Medical Association (MSMA).I would like to urge you to join and tell why it is advantageous to do so.

Back in 1856, a small group of doctors met and decided to join in an affiliation of physicians to foster the interchange of scientific knowledge and information about public health matters in the State of Minnesota. That was the beginning of the MSMA, and its responsibilities are no different today than they were then, only a great deal more complicated. The MSMA is still dedicated to the dissemination of scientific knowledge to its membership. It is still involved in many and sundry public health matters, and because of the trend of government to get into the entire field of health care delivery, the MSMA has developed an entirely new division, the Socio Economic Division, to deal with this entire field of third party payers, legislative edicts, health service agencies, etc.

If you are a student or a resident, you probably say to yourself, ''Why join! I have no say in how things are done anyhow.'' But you do! We have a number of students and residents on most of the standing committees of the Association.

If you are an institutional physician, you have probably said to yourself—''who needs them—why pay those dues? For what? We are an island unto ourselves. Most of my support comes out of the tax payers' funds, and I really can't relate too well with the MSMA anyhow. Besides, a lot of my support for research and work comes from federal grants, and this is not directly related to the state.'' I would like to quote from the words of the song, ''Look Around and Follow Me'' and show you how closely you do relate to the state and the practicing private physicians on the ''outside.'' The funding, particularly the University of Minnesota Medical School, that comes from the legislature has been staunchly supported by the MSMA legislative effort. The new construction of the medical building on the medical school campus has been wholeheartedly supported by the MSMA before legislative committees, I know. I was there testifying in your behalf. CME courses sponsored by the University Medical School have been supported by the MSMA.

The financial support given by the legislature to the new Mayo Medical School was supported by the MSMA in various legislative committees, I know. I was there. There has been widespread support of all Mayo Clinic functions involving their fall refreshers and CME courses by the MSMA organization. The MSMA has supported and campaigned for candidates for AMA commission offices from both the Mayo and the University of Minnesota Medical Schools. Most of the doctors in the state who are MSMA members are giving referral support to both major institutions.

These are just a few of the reasons *why* the MSMA needs and asks for institutional membership support. What else?

There are better than 30 standing committees of the MSMA—each one of which is made up of practicing physicians, some residents, and some students. Each of these committees is working voluntarily for the betterment of health care and health care delivery in the State of Minnesota. These committees need and are getting good staff support, as far as the staff will reach, but all of the projects fostered by these standing committees just cannot get the total support they need with present staff personnel.

As I mentioned previously, we have a whole new division in the MSMA office, the Socio Economic Division. This Division deals full time with legislative issues, health science agencies, medical services, and health education. We can in no way afford the staff that the legislature can afford or the various federal agencies can afford, but it is amazing what has been done for you in the legislature and health science areas by the staff we do have. Past issues of this Journal have kept you abreast of what MSMA has done in the legislature for you and the people of Minnesota, so that you can still pretty well have the freedom to practice medicine unencumbered by mandatory rules and regulations that would interfere with you and your good judgment in the care of your patients.

Health service area task forces are being established by the MSMA throughout the state in every health service area to deal with the health service agency of that area as established by Public Law 93-641. This is no small task, but it is being done and is a program that has received national recognition.

Professional liability insurance is still available, and although the premiums have certainly increased and are more than one would like, they are still far below other states. Your MSMA is not satisfied with the status quo, however. Tort reform legislation has been drawn up; a risk management program for doctors' offices is in production and will be ready shortly; captive company possibilities are being investigated—all with the idea of keeping down your professional liability premiums.

Continuing Medical Education Programs were set up by MSMA, and you are well aware that 50-credit hours per year were necessary for MSMA membership over the previous three years. With passage of recent legislation, the Board of Medical Examiners was given the authority for requiring proof of CME participation for re-licensure. The Medical Education Committee of MSMA has worked with the Board of Medical Examiners very closely on this program and is in hopes that it will be ready for implementation by 1978.

The Child Health Committee has been working with state government agencies in an attempt to formulate an acceptable pre-school screening program which was mandated by the last legislature. With their help, it is hoped that this program will not only be effective but also not so cumbersome to the practicing physicians. Every effort in this program is to include a meaningful follow-up mechanism.

The MSMA has recently established a Disabled Physicians' Committee whose task is to seek out our disabled peers and attempt to rehabilitate them if at all possible, so that their many years of training and experience will not be wasted but useful in the health care of their fellow man.

An Ad Hoc Committee on Medical Discipline has been established and is actively working to draw up ground rules and methods of disciplining our own ranks to provide the citizens of the State of Minnesota with a program that assures them of competent, disciplined medical care.

A health care cost commission has been organized by the MSMA, inviting leaders of business and labor from the outside to help study and find solutions to the ever escalating costs of health care.

These are but some of the things MSMA is doing for you and the citizens of Minnesota. These are the things that take up your membership dollars.

I can assure you that all of these committees and commissions need more helping hands and innovative ideas. If you are a member, volunteer not only your dues but your time and effort as well in the work of these committees. If you are *not* a member—how about it?

I have listed some of the things MSMA is doing for you—how about your helping us to help you by becoming a member? Strength in this organization like in any organization is directly dependent upon the number of members. If a majority of those members are dedicated, working members as well, you have a viable, forceful, influential organization. We are well on the way. Won't you help?

C.A. Anderson MD

C. A. Anderson, M.D.
President

Editor's Notebook

How To Get Into Medical School

Check Appropriate, Objective, and Nondiscriminatory Answers

A. Achieve close to an A average (3.3 or above) in four year course at well-known college or university, or be a late bloomer with a sharply rising grade point average.
B. Take difficult pre-medical courses, particularly biology, chemistry, or physics.
C. Participate in extracurricular activities.
D. Establish reputation as leader.
E. Have impeccable and warm letters of evaluation from premedical college advisor, college roommate, and employer.
F. Lead well-rounded life, exude intellectual curiosity, and project emotional maturity.
G. Work as volunteer in hospital or for other charitable community organizations.
H. Score high on Medical College Admissions Test (MCAT).
I. Make good impression in interview or interviews with member or members of Medical Admission Committee.
J. Be young, preferably less than 25.
K. Be a woman.
L. Be a member of a minority group (Black, Puerto Rican, Hispanic, or Oriental).
M. L but not A through J.
N. All of above.
O. Any combination of the above.

This list had its origins in an interview I conducted with Doctor Albert Sullivan, Associate Professor of Surgery and Associate Dean of Admissions and Student Affairs at the University of Minnesota Medical School. The interview appears in this issue on page 731. The list is mine, not Doctor Sullivan's. I absolve him of blame because the list raises controversial issues about who is admitted to medical school and for what reasons.

Contents and Purpose of List

Before you read the interview, review the list. The list contains items Doctor Sullivan chose to discuss — and myths he wished to dispel. If you want, think of items on the list as signposts for following the road the interview took.

Persuasions

In the course of the interview, Doctor Sullivan persuaded me of these things: (1) getting into medical school is tougher than ever, (2) Minnesota is blessed with intellectual talent and good medical school candidates; (3) the Admissions Committee at the University of Minnesota Medical School has a well-conceived, even-handed, and socially-conscious scheme for judging and selecting students; and (4) results of the admissions process, viz. who gets in and who doesn't, is a political minefield.

A Matter of Demographics

You don't have to go beyond simple demographics to see why getting into medical school is so difficult. As a society we are now reaping the harvest of the 1950's baby boom. The number of slots in medical school classes have gone up, but not enough to compensate for the volume of candidates who are flooding in (Table 1).

TABLE 1

First-Year Classes	Number of Applicants	Number of Accepted Applicants	Percent of Accepted Applicants
1970-1971	25,000	11,500	46.0
1971-1972	29,200	12,300	42.3
1972-1973	36,100	13,800	38.1
1973-1974	40,500	14,300	35.4
1974-1975	42,600	15,100	35.3
1975-1976	42,300	15,400	36.3
	70% increase	34% increase	9.7% decrease

Medical school activity. Statistics from A. E. Crowley, editor, "Medical Education in the United States 1974-1975." JAMA 234:1337. Data for 1975 and 1976 are preliminary estimates of Association of American Medical Colleges.

Competition and Curriculum

More students are struggling to get into medical schools, and competition is keener. According to Doctor Sullivan, pre-medical students' Grade Point Averages rise each year. And not because of grade inflation. Medical College Admission Test Scores, an objective and comprehensive examination revised yearly, go up too.

And, contrary to what hardheads who bewail modern permissiveness might imagine, present day pre-medical curriculum still demands a thorough grounding in difficult science and mathematics courses (Table 2).

TABLE 2

Required Courses	Percent of Courses Required by Medical Schools
Biology (comparative anatomy, embryology, zoology, genetics)	20%
Chemistry (inorganic, organic, physical chemistry, quantitative analysis, qualitative analysis)	36%
Physics	15%
Mathematics (analytical geometry, calculus, trigonometry)	11%
Humanities (English, language, literature)	16%
Social and behavioral sciences	2%

Required Premedical Courses at United States and Canadian Medical Schools, calculated from V. L. Wilson, editor, Medical School Admission Requirements, U.S.A. and Canada (Washington, D.C.: Association of American Medical Colleges, 1974, page 3).

Composition of Classes

The pre-medical curriculum may not have changed, but composition of medical school classes has. The University of Minnesota Medical School now has 20 to 25 percent women per class. This is in keeping with national trends. In 1939, women made up 5.0 percent of medical classes; in 1970, 11.1 percent; and in 1974, 22.3 percent.[1] Of 1975 American medical school graduates, 13.4 percent were women, the largest percent in history.

Ethnic minority students have also increased. In 1969-1970, medical schools admitted 4.2 percent minority students. By 1974-1975, the proportion of minorities had climbed to 8.8 percent.[2]

At the University of Minnesota Medical School, recruiting qualified women medical students has not been a problem.

But recruiting minority students has. For several reasons. In the first place, the school has aimed for a goal of 10 percent minority students. Yet less than ½ percent of Minnesota Medical School candidates are from ethnic minorities. This small proportion of minority students has led University of Minnesota Medical School officials to recruit out-of-state minority students.

Problem and Question

Out-of-state recruiting poses a financial problem: a tuition cost of nearly $7,000 a year for minority non-residents who generally cannot afford to pay, compared to $2,700 for state residents, who generally can.

Minority recruiting also brings up a social question: Should Minnesota taxpayers pay to educate minority students from other States when white students from Minnesota, who are often better qualified by traditional standards, are being denied admission because of lack of available places? Not an easy question, but one which the United States Supreme Court will tackle this October, just after this issue reaches you.

The Bakke Decision and "Reverse Discrimination"

Allan Bakke, a white would-be medical student of Norwegian ancestory, was born in Minneapolis in 1940. He graduated from Coral Gables High School in Florida, then completed the University of Minnesota Engineering School in 1963 with a 3.51 average. Bakke has brought suit against the University of California Medical School at Davis for "reverse discrimination" after he was rejected for admission in 1973 and again in 1974.

In 1972, Bakke applied with 2263 others to the Davis School. Before that, he had served with the U.S. Marine Corps as a second lieutenant. This service included seven months in Vietnam. In 1967, he signed on as an engineer at the Ames Research Center in Palo Alto, a National Aeronautics and Space Administration (NASA) Laboratory. At the NASA Laboratory, he decided to become a doctor and took courses to meet the requirements.

Two-Track System

The Davis School has a two-track system for admitting medical students: one for whites and one for minorities. In 1973, the first year Bakke was rejected, the 16 minority students accepted had undergraduate grade averages of 2.88, while the 84 whites admitted had averages of 3.49.

Bakke's Credentials

Bakke had many things in his favor for being admitted to medical school: a high-grade point average, solid letters of recommendation, a history of hospital volunteer work, a well-written essay articulating his reasons for wanting to be a doctor, and these MCAT scores: 97 percentile in scientific knowledge, 96 percentile in verbal ability, 94 percentile in quantitative analysis, and 72 percentile in general knowledge. All these scores ranked him well above the average candidate accepted for admission.

The faculty member who interviewed Bakke reported: "The applicant is a well-qualified candidate for admission whose main hardship is the unavoidable fact he is 33. His is a pleasant mature person — tall and strong and Teutonic in appearance (not surprising from his Minnesota background), a believer in personal health and fitness; he is careful about his diet and vices, runs every day and is generally interested in improving his actuarial statistics."[3]

Bakke understandably felt he was denied admission because 16 of 100 places in the medical school at Davis were reserved for minority students. The Board of Regents at the University of California did not deny Bakke's allegation. And so the stage was set for the case of *The Regents of the University of California vs. Allan Bakke.* Given Bakke's credentials and the circumstances of his being denied admission, his lawyer will argue Bakke was denied admission because of his race and has been deprived of the 14th Amendment provision of equal protection under the law. The California Supreme Court, in a 6-1 decision, has already said the Davis Medical School's two-track admission policy is unconstitutional. The United States Supreme Court must now decide if racial quotas to compensate for past prejudices are constitutional.

Historic Supreme Court Decision

Many legal authorities and social critics consider the Bakke Decision the most important Supreme Court ruling since the school desegregation ruling in 1954.

Supporters of "affirmative action" programs and civil rights leaders claim a decision for Bakke will destroy two decades of racial progress. Opponents of quotas, however, argue it is wrong to categorize someone by race alone and to deny a position on the basis of race.

What will the Supreme Court decide? No one knows, of course, but one thing is sure. Plenty of conflicting opinions are being handed out.

To wit:

- The *New York Times,* in an unusual full-page editorial, "Reparation, American Style," said "goals" or "quotas" are needed because "numbers represent policy" and "because blacks need to be represented with census-like precision in the professions."[4]
- The *Christian Science Monitor* tentatively concluded: "But the rights of Allan Bakke must also be considered . . . Should whites, even for a temporary interim transition period, be forced to take a back seat to minorities? For many years, it should be remembered, the back seat was reserved for blacks."[5]
- The United States Justice Department contends it is not constitutional to set aside a specific number of places in each class for minority applicants.[6]
- Joseph Califano, Secretary of HEW, is known to feel "quotas," or "goals," as he prefers to call them, are necessary for affirmative action programs.
- The American Federation of Teachers Meeting in Boston recently voted 195,135 to 73,503 to reject racial quotas, thereby putting their collective weight behind Bakke.[7]

Arthur Schatzkin, M.D. and John Yergan, M.D., members of the staff at Montefiore Hospital in New York, came on strongly for minority quotas with this line of reasoning in the September 8 issue of the NEW ENGLAND JOURNAL OF MEDICINE:[8]

> "We believe that fixed-percentage quotas are necessary to reverse the present downward trend and guarantee that minority admissions "goals" are met. This opinion does not imply support for the types of quotas that historically discriminated against deserving candidates. It means, instead, that fixed-percentage minorities is at present the only way to define and guarantee a program to expand opportunities for all, and to improve the human relations of the profession."

Conclusion

Getting into medical school is not what it used to be. And perhaps it should not be. Still, Bakke has a point, and it deserves to be heard and listened to and argued before the United States Supreme Court.

Richard L Reece MD

References

1. American Medical Association, Socio-Economic Issues of Health, 1975-76 (Chicago: Center for Health Services, Research and Development, AMA, 1976, page 194
2. Crowley, AE, Editor: Medical Education in the United States 1974-75. JAMA 234:1339, 1975.
3. Lindsay, R: Would-be Doctor's Suit May Radically Change Bias Laws. New York Times Service, in Tuesday, May 31, 1977 Minneapolis Tribune.
4. Reparation, American Style. New York Times, page 16-E, Sunday, June 19, 1977
5. Racial Quotas, Who Loses? The Christian Science Monitor. Thursday, September 8, 1977.
6. Rosenbaum, DE: Strict Racial Quotas at Colleges Illegal, Justice Officials Say New York Times Service, in Minneapolis Tribune, Thursday, September 8, 1977
7. Mutch, D. Teachers Reject Race Quota Policy. Christian Science Monitor Tuesday, August 23, 1977.
8. Schatzkin, A and Yergan, J: The Case for Minority Admissions. New Engl J Med 297:554, 1977.

Minnesota Board of Medical Examiners

State of Minnesota
County of Hennepin

Before the State of Minnesota
Board of Medical Examiners

In the Matter of the Proposed Adoption
of Rules of the State of Minnesota
Board of Medical Examiners Relating
to Continuing Medical Education

Notice of Hearing

Notice is hereby given that a public hearing in the above-entitled matter will be held pursuant to Minn. Stat. § 15.0412 subd. 4 (1976), in the Board Room, Minnesota Department of Health Building, 717 Delaware Street Southeast, Minneapolis, Minnesota, on Tuesday, October 4, 1977, commencing at 9:00 a.m.

All interested or affected persons will have an opportunity to participate concerning the adoption of the proposed rules as captioned above. Statements may be made orally and written material may be submitted. In addition, whether or not an appearance is made at the hearing, written statements or material may be submitted by mail to George Beck, Hearing Examiner, at Room 300, 1745 University Avenue, Saint Paul, Minnesota 55104, telephone (612) 296-8108, either before the hearing or within five (5) days after the close of the hearing. All such statements will be entered into and become part of the record. Testimony or other evidence to be submitted for consideration should be pertinent to the matter at hand. For those wishing to submit written statements or exhibits, it is requested that at least three (3) copies be furnished. In addition, it is suggested, to save time and avoid duplication, that those persons, organizations, or associations having a common viewpoint or interest in these proceedings join together where possible and present a single statement in behalf of such interests. The conduct of the hearing shall be governed by the rules of the Office of Hearing Examiners.

A copy of the proposed rules is attached hereto and made a part hereof.* More copies of the proposed rules are now available and at least one free copy may also be obtained by writing to the State of Minnesota Board of Medical Examiners, 717 Delaware Street Southeast, Minneapolis, Minnesota 55414. Extra copies will also be available at the door on the date of the hearing.

A Statement of Need explaining the Board of Medical Examiners' position relative to the necessity for the proposed rules and a Statement of Evidence outlining the testimony and evidence which will be introduced by the Board in support of the proposed rules will be filed with the Hearing Examiner's Office at least twenty-five (25) days prior to the hearing and will be available there for public inspection. The statutory authority of the Board of Medical Examiners to promulgate and adopt these rules is contained in Minn. Stat. § 214.12 (1976).

In addition, please be advised that Minn. Stat. ch. 10A requires each lobbyist to register with the State Ethical Practices Board within five (5) days after he commences lobbying. Lobbying includes attempting to influence rule making by communicating or urging others to communicate with public officials. A lobbyist is generally any individual who spends more than $250 per year for lobbying or any individual who is engaged for pay or authorized to spend money by another individual or association and who spends more than $250 a year or five (5) hours per month for lobbying. The statute provides certain exceptions. Questions should be directed to the Ethical Practices Board, 41 State Office Building, Saint Paul, Minnesota 55155, telephone (612) 296-5615.

Dated: August 11, 1977

State of Minnesota
Board of Medical Examiners
LOREN E. NELSON, M.D.
Secretary-Treasurer

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*Not enclosed herewith

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Familial Hemiplegia Migraine

RICHARD M. PARRISH, M.D.* and HAROLD STEVENS, PH.D., M.D., F.A.C.P.†

Focal neurological signs and symptoms, varying in duration, may accompany migraine, including hemiplegia, aphasia, and homonymous hemianopsia. We report several representative instances and pedigrees, outline the differential diagnoses and putative pathogenesis. The rationale of management differs from the more benign classical migraine.

MIGRAINE IS AN ANCIENT well known entity with a vast literature, some of it enriched by vivid descriptions by scholarly and articulate observers who were victims. Some of these accounts include instances of hemiplegic migraine, that is migraine associated with focal neurological signs; for example, attacks of hemiplegia and aphasia were reported by Tissot, Parry, Lebert, Abercrombie, and Travers[1]. Sir John Herschel, the famous crystalographer of the mid 19th century, gave a graphic account of homonymous hemianopsia as did William Hyde Wollaston, a physicist and physician. Like Sir John he had an interest in optics, was inventor of the camera lucida and discovered the elements of palladium and rhodium.[1]

Hemiplegic migraine has been defined in various ways[2–11]. Some authors[2,11] prefer to reserve this diagnosis for migraine headaches accompanied by a true hemiplegia which persists during and after the headache. Others adopt a broader definition to encompass any migraine headache associated with unilateral hemimotor and/or hemisensory phenomena which may resolve during the headache phase of the attack. Most authors agree that there is an unusually strong familial tendency in either type of hemiplegic migraine and attribute the focal neurologic phenomena to transient cortical ischemia secondary to vasospasm of a major branch of the internal carotid artery. Whitty[5], and later Ross[7] and Rosenbaum[8] suggested that there are two distinct forms of this syndrome; the familial—characterized by a stereotyped onset marked by confusion and somnolence and with hemiplegia outlasting the headache and affecting several other family members in an identical way; and sporadic, which is similar to classic migraine in that the sensorimotor phenomena coincide with the prodrome and subside as the headache begins. These attacks may occur on either side and these patients may have classic or common migraine headaches in addition to their more severe variety. Ross[7] terms these two groups "major" and "minor" hemiplegic migraine, respectively. In Bradshaw and Parsons' exhaustive review of this subject in 1965[10] they combined both forms of hemiplegic migraine in their discussion of this syndrome and conclude that these patients exhibit "a spectrum of symptomatology ranging from brief paresthesia through moderate numbness and weakness to profound hemiplegia often with impairment of consciousness. Within this spectrum individual patients and their relatives do not always maintain a fixed position and may at one time have brief sensory symptoms and at another, long-lasting hemiplegia". They note that the "narrower definition" of familial hemiplegic migraine requiring "profound long-lasting and recurrent paralysis in association with migrainous headaches—implies that there is some essential difference between the milder sensory and the more severe motor varieties which is not, in fact, evident." Heyck[12] concludes that "hemiplegic migraine has the same genetic and pathophysiological background as ordinary migraine," and Ross[7] concludes that hemiplegic migraine occurs as a non familial syndrome and that the "significance of migraine accompanied by transient hemiparesis is probably the same as that accompanied by visual disturbance." Our own experience more-closely coincides with the broader interpretation of the syndrome of hemiplegic migraine in which there is a spectrum of genetic patterns and symptomatology—not clearly separating the individuals into two distinct groups. Moreover, from a clinical

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see editorial, page 753.

standpoint the same considerations for differential diagnosis will have to be given to both the so-called major and minor types of hemiplegic migraine.

Approximately 30 percent of migraine sufferers have transient unilateral limb symptoms on at least one occasion.[8,10,13] These are usually paresthesia and most-commonly are in the finger-tongue distribution. These sensory disturbances usually occur in the prodrome or aura phase of the headache and are in addition to the visual symptoms. A march may occur and the symptoms may spread in a Jacksonian fashion[12]. They may last from several minutes to several hours and may terminate prior to the headache's onset, during the headache, continue past the headache, or rarely—not be associated with a headache at all (as in the case of William Hyde Wollaston and Caleb Hillier Parry)[1]. More dramatic and disturbing to the patient and doctor alike, are the headaches associated with the abrupt onset of hemiplegia and hemianesthesia with aphasia and confusion, which also may continue past the headache and may last for several days. Several cases in the literature were noted to result in permanent neurologic deficits after repeated attacks and there have been even some deaths attributed to an attack—although these are certainly the exception[10,12,14,15-19].

Patients often confuse numbness with weakness or paralysis, and the sudden and unpredictable onset of signs that are evanescent makes documentation of motor impairment difficult. Most cases examined during an actual episode of full-blown hemiplegic migraine have demonstrated long tract signs, however. Several patients have been subjected to arteriography, to rule out possible life-threatening intracranial disease—with dire results, i.e. precipitation of another attack and even permanent hemiparesis[5,6].

The headache of hemiplegic migraine is usually described as being severe and throbbing in nature. In Bradshaw and Parsons'[10] study of 75 patients with this condition, 30 percent of the patients had generalized or bilateral headaches and 70 percent had unilateral headaches, (of which 50 percent were contralateral to the limb symptoms and 20 percent were ipsilateral to the limb symptoms). This data can be compared to that of Selby and Lance's[20] general view of 500 patients with all types of migraine, in which they found that 38 percent of the patients had unilateral headaches only; and 24 percent had a mixture of both types. The results seem to indicate that a higher proportion of patients with the hemiplegic migraine syndrome have unilateral headaches. Bradshaw and Parsons noted also a female preponderance of three to one with 75 percent of their patients having evidence of "a minor psychiatric deviation". Other authors, including ourselves, have not noted a sex preponderance in this condition. Motor pareses occurred in at least one attack in 44 percent of cases in Heyck's study[12] and in 62 percent of Bradshaw and Parsons'[11] study.

The reported familial incidence of hemiplegic migraine has varied from as low as 4 percent[12] to 20 percent[10]. Other studies are based on descriptions of several selected families with this disorder, making a statement about true familial incidence meaningless. Virtually all authors have noted the high familial history of ordinary migraine (around 50 percent) in their patients with the hemiplegic variety. Clarke[3] and Bruyn[21] refer to an autosomal dominant inheritance pattern in this disorder, whereas Blau and Whitty[6] proposed an autosomal recessive mode of inheritance. Our own experience also seems to suggest an autosomal dominant form of inheritance in one family, (Figure 1) whereas in the other family in which all the offsprings were affected in a stereotyped manner, none of the parents or grandparents were affected by focal symptoms—although there was a family history of ordinary migraine.

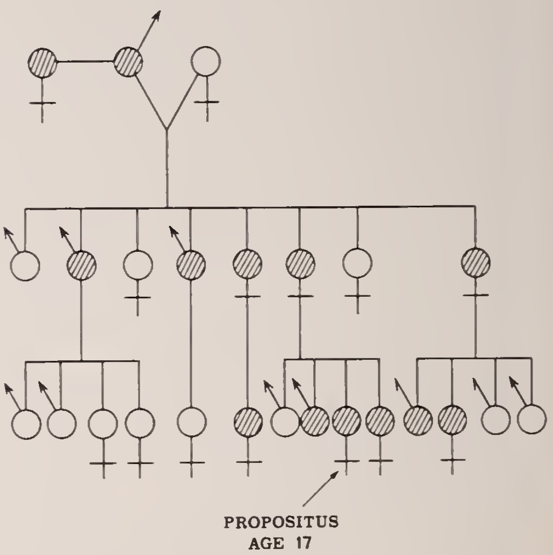

Fig. 1—Pedigree of family with familial hemiplegic migraine showing rarely reported high incidence in family members. Shaded areas represent those afflicted.

Representative of this entity is the following case report of a 46-year-old housewife and part time crossing guard. Her attacks began at age 13, occurred eight to 10 times a year, more or less stereotyped, preceded by an aura of exhiliration. This is followed by "noticing my own hand and arm like it belonged to someone else. I have control of it but when it comes into the range of vision I turn and look at it like someone else is moving the arm besides me''. This is clearly autotopagnosia, a frequent and at times isolated subjective symptom preceding the headache and the other focal neurological symptoms. These latter consist of paresthesias of the left side of the tongue followed by numbness of the lips and face and then the fingers, arms, and legs become involved. The entire attack lasts two to eight hours. Cafergot and Empirin partly mitigate the headaches which are diminishing in frequency. Her EEG is abnormal (Figure 2).

An analogous focal attack occurs in Case 2, her daughter. She is a 21 year old clerk-stenographer whose attack began at age 16 with spreading paresthesias in her fingers and hand, arms, face, and tongue on the right associated with aphasia. On one occasion her right leg gave way and she fell. The attacks usually last one to four hours, occur four to five times a year, are relieved by Cafergot. They are diminishing in frequency. Her neurological examination is normal, her EEG showed a 14 & 6 per sec. pattern. Case 3 is her brother who is a 20-year-old jeweler whose attacks began at age four, occur two times a year, are also decreasing in frequency. They are characterized by abrupt onset of confusion associated with severe headache lasting up to three hours. Cafergot helps. His EEG shows a minimal abnormality with a right occipital focus.

Case 4 is another sibling, a 27-year-old school teacher whose attacks are characterized by spontaneous onset of aphasia. They began at age 10, occurred about four times a year until age 15 when they stopped. The headache was always left sided. Right sided paresthesias were a common accompanying pattern of symptoms lasting about 30 minutes. The headache lasted four hours, benefited by Cafergot.

Case 5 is the father of Case 1. He is an 83-year-old carpenter whose attacks began at age 25, occurred up to six times a year, associated with right sided numbness and aphasia. ''I say something different than what I try to say.'' Numbness of the right side of the tongue and right homonymous hemianopsia accompany the attacks. Aspirin helps.

Data on another family discloses hemiplegic migraine in four siblings. The eldest is a 28-year-old white male singer who developed complicated migraine at the age of 12 when he was in the 6th grade. Most of his attacks have been stereotyped and involve the left side of his body. He claims to be ambidextrous. Typically, he experiences exhilaration and heightened athletic ability prior to his attacks. This enhanced skill in competitive sports comes on rather dramatically and the patient can recall in great detail performing allegedly amazing physical feats during this 20 to 30 minutes period. He then begins to experience blurred vision and numbness and tingling in his arm and mouth on one side which often spreads to include his leg on the right side. In his first major attack in 1960 the patient was admitted to a hospital where it was found that his entire left side was numb and his left leg was weak. He had a Babinski on the left, a left central facial weakness, and tongue deviated to the left. He experienced an extremely severe unilateral throbbing headache contralateral to the leg symptoms, accompanied by confusion, delirium, and vomiting. The headache phase lasted about eight hours, gradually subsided.

Between episodes, he is asymptomatic. Common precipitants are exercise and a crowded schedule. He has had no headaches since 1970 which he attributes to marriage and a more relaxed life style.

His brother is a 27-year-old entertainer who is still having attacks of hemiplegic migraine. In recalling his first episode when he was in sixth grade the patient remembers that he screamed with pain and thought ''he was going to die.'' He termed it a ''very traumatic experience.'' Typically his prodrome begins with the exhilaration and heightened athletic ability as described by his brother. Vision becomes distorted ''occurs in gaps and crystalline shapes and forms around the gaps.'' The visual disturbances are followed by numbness. The sequence involving the right side is as follows: his little finger is numb first, then his thumb, then his middle fingers, then his entire hand, followed by his arm, his nose, then his upper lip, his lower lip, and then his foot which feels like it has no sensation whatsoever. He notes that this takes about 1½ minutes for the entire cycle. His tongue feels

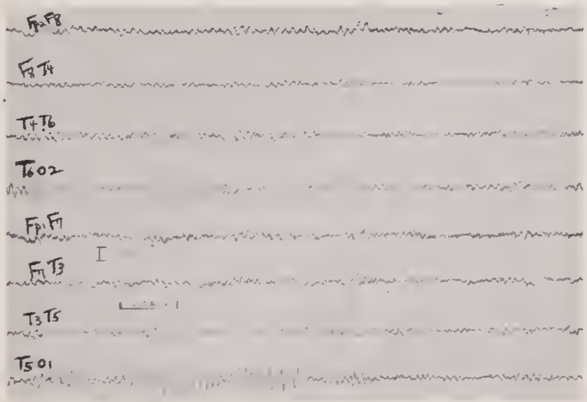

Fig. 2—EEG of a 40-year-old housewife showing single spike discharges appearing from both sides with sleep and with waking. No focal abnormalities are seen.

"weird" and he has difficulty speaking which usually means difficulty saying what he wants to say. Photophobia ensues. Usually, about an hour after the aura begins, his vision begins to clear while his right side is still numb. The numbness then gradually subsides in the same order of onset. A period of relaxation and sleep follows. This is followed by severe one sided headache in the temporal region which is accompanied by nausea and vomiting. Occasionally he has felt swollen vessels in the region of his face. This headache can last up to 8 hours, followed by a hangover phase which can last 20 minutes to 36 hours or he feels as if he has "a rainstorm in my head waiting for it to clear." Many of his more recent attacks which occurred while he was singing did not affect his performance and he noted that he could sing notes which he never could reach otherwise. His most recent episode occurred on both sides of his body, preceded by an aura characterized by an "echo effect" in which the TV sounded as though it was echoing around the room. This patient has experimented with various preventive procedures, found that 4 Excedrin immediately at the onset of headache seems to work best. He also noted exercising or massaging his neck will abort a headache. He can sometimes concentrate on reading or another activity, thereby abort a headache. Ice packs help. Cafergot makes the aura and headache worse. He noted that if exercising relieved the aura and if he stopped exercising the symptoms would come back, with exercising again they would resolve. He has never had a simple migraine headache. Duration and intensity of the attack may differ. He describes himself as a perfectionist, and an obsessive compulsive personality. He has had 2 attacks in the past 18 months, but notes they are getting less frequent. He also noted that certain smells and tastes precipitated the attack. Alcohol, cigarettes, hashish, marijuana, and LSD have had no effect in precipitating attacks of migraine.

His sister who is a 24-year-old interior designer has experienced only one severe attack of hemiplegic migraine which was in seventh grade. During the gym period preceding the attack she experienced heightened athletic ability. During her subsequent math class while taking an examination she was able to perform remarkably well. She began to feel weird, fell out of her chair, and walked into a wall. She experienced photophobia and other visual symptoms. She claims that the aura was identical to her brothers' attacks with unilateral numbness.

Her sister, age 23, suffered her first attack in the sixth grade. She remembers being panic stricken. This attack occurred during an exam which followed a recess. First she noticed a central blind spot in the right eye and then numbness in her right hand. She finished the test well before anyone else in the class, but noted she had difficulty in saying what she meant, couldn't get out the door, and hit the wall, had right sided numbness associated with difficulty swallowing, photophobia, and dysacusis. The headache which lasted up to 12 hours was accompanied by nausea and vomiting. The side of the numbness has alternated in different attacks, some accompanied by urticaria. The last severe attack occurred six years ago. Initially the attacks were as often as every two weeks. During her "hangover phase" she describes a period of heightened perception where objects appear vivid, her taste is acute, and even "saltine crackers are out of this world". Skipping a meal and fatigue can precipitate an attack.

Another sister, the youngest, age 19, experienced one attack of classical migraine at age 11. She has had no subsequent attacks.

The mother of the afflicted siblings, age 50, has had only two attacks of migraine which occurred in her mid 40's, during the menopause. Both attacks were brought on by nervous tension and were separated by a two-year span. Her attacks have not been as severe as her sons although she experienced visual symptoms and numbness on her left side which lasted for about 20 minutes. The headache is accompanied by nausea and vomiting and she usually goes to sleep. Aphasia was described as "being difficult to communicate".

As stated, paroxysmal hemiplegic migraine is frequently associated with a positive family history either of classical migraine or more typically of hemiplegic migraine. In addition to the above pedigrees, three individual cases without definite family history were encountered with hemiplegic migraine. One a 52-year-old retired government worker suffers periodic unilateral headache with right homonymous hemianopsia and aphasia. The attacks last a half an hour to eight hours associated with flatulence. Unilateral paresthesias may accompany the above symptoms.

A 44-year-old waitress suffers similar attacks since age six with a spreading sensory march beginning in the tongue associated with dysarthria. They are diminishing in frequency.

A 15-year-old boy developed hemiplegic migraine at the age of nine with six to seven attacks per year associated with dysarthria, right sided spreading paresthesias, and blurring of vision. His medical history is negative aside from multiple allergies.

Pathophysiology

The pathophysiology of migraine headaches remains an enigma. It has been generally assumed that the prodrome phase is due to intracranial vasoconstriction causing localized cortical ischemia, followed by extracranial and/or intracranial vasodilation causing the headache. The best evidence in support of this theory is that exposure of migraine patients during the aura phase to potent cerebro vasodilators (5 percent carbon dioxide or amyl nitrite) may effect regression of the symptoms; conversely vasoconstrictors in the headache phase often relieve the headache. Skinhoj[22] used the intracarotid Xenon 133 clearance technique to determine regional blood flow during the prodrome phase in 4 patients with migraine. All patients showed a marked reduction in cerebral blood flow in the prodrome and hyperperfusion in the headache phase. They postulate that the vasoconstriction may have produced cerebral lactic acidosis due to ischemia and subsequent hypoxia, since in all cases but one, increased lactate values and decreased bicarbonate values were found in the lumbar cerebrospinal fluid. This lactic acidosis and decreased perfusion was found in patients with marked prodromal symptoms and also in patients with common migraine. Angiography did not reveal any narrowing of the larger branches of the internal carotid artery but did confirm the findings of Dukes and Vieth[23] of an abnormal filling of the basilar artery area. They conclude that "vascular dysregulation in the basilar artery as well as in the carotids plays a substantial role in the pathogenesis of migraine".

In O'Brien's review[24] of the hemodynamic changes in migraine, he concludes that a generalized cerebral vasoconstriction is associated with but not the cause of the specific prodromal symptoms and suggests that an "unidentified third factor" may be implicated. He also suggests that the vasodilation of the headache phase may be a reactive hyperemia to the prodromal vasoconstriction. Both authors note that the above changes are not peculiar to complicated migraine and can be demonstrated equally as well in common migraine.

More recently Kalendovsky and Austin[25] examined platelet aggregability and several other coagulation parameters involved in the clotting mechanism in patients with migraine and showed that patients with hyperaggregable platelets but normal plasma coagulation factors were subject to many transient episodes of neurologic disturbances, but patients with hypercoagulability of both platelet and coagulation phases, often presented with a completed stroke as one of their first episodes of focal cerebral dysfunction. They suggest that small thromboemboli may further compromise the reduced cerebral perfusion in migraine, causing the stroke. It is somewhat unclear in their study whether they are grouping patients with migraine who later develop strokes together with patients with complicated migraine and therefore may be assessing predisposing factors to thromboembolic disease instead of the determinants of the focal neurologic deficits in complicated migraine.

Dynes[4] attributes the cause to vasomotor and endocrine disturbances. Whitty[5] explains the prolongation of symptoms and signs in hemiplegic migraine and lack of permanent residua on the basis of "angioneurotic edema" of the brain—a concept first suggested by Osler. He goes on to state that after arterial spasm there is a subsequent localized edema in the area supplied upon restoration of blood flow. This reversible focal edema of the brain is analogous to Osler's "hives of the brain". In 1955 Blau and Whitty added the concept of a "local factor" to explain unilateral cerebral dysfunction and suggested that thrombosis with subsequent recanalization of the terminal arterioles may occur.[6] Ross[7] subscribes to the theory of vasospasm and Rosenbaum[8] notes that the EEG changes during the aura are similar to those produced by intentional oxygen deprivation. He also concurs with Whitty's cerebral edema theory on the basis that prolonged vasospasm alone would cause irreversible brain damage. He concluded that patients with hemiplegic migraine have a genetic susceptibility to periodic cerebro vascular spasm which results in a focal and reversible edema of the involved cortical structures. In support of focal arterial vasospasm is the study by Guest and Woolf[26]. They performed an autopsy on a 28-year-old man who presumably died of cerebral infarction during an attack of severe hemiplegic migraine. Histologic examination revealed signs of ischemia predominantly in the territory of the left anterior cerebral artery and this "irrefutable evidence of focal disturbance of cerebral blood flow was unassociated with the slightest structural abnormality of the parent vessels or heart". Bradshaw and Parsons[10] reported one case of a patient who took large doses of Ergotamine Tartrate which precipitated an attack that resulted in residual hemiparesis and impairment of mental faculties and attributes the outcome to prolonged vasospasm or thrombosis.

Heyck[12] suggests that the EEG abnormalities are in favor of a superficial localization of the disturbance. He further notes that the symptoms most often begin in the visual cortex and slowly progress over the parietal lobe to the central cortical lesion—"a path which is not related to any distinct area of vascular supply".

Dukes and Vieth[23] performed carotid arteriography in a patient with hemiplegic migraine and obtained serial films before, during, and following the patient's migraine attack which showed a progressive decrease in caliber and filling of the internal carotid system with reflux into the vertebral system during the prodrome. Upon resolution of the patient's symptoms and onset of the headache there was restoration of normal blood flow.

In the related condition of ophthalmologic migraine, Walsh and O'Doherty[27] conclude that edema of the arterial wall of the internal carotid artery in the cavernous sinus exerts direct pressure on, and/or ischemia of the vaso nervorum of the third, fourth, and sixth nerves as they traverse the cavernous sinus resulting in extra-ocular muscle paralysis. Kunkle[28] notes that the "spreading depression" of the electrical activity in the cerebral cortex of animals "bears some resemblance to the slow evolution of the visual symptoms of migraine".

Friedman[29], Dalessio[30], and Fanchamps[31] reviewed some inconclusive studies which suggest various vasoactive substances (neurokinin, serotonin, histamine) in the pathogenesis of the migraine phenomenon. A recent report by Dooling and Sweeney[32] in which a woman suffered migrainous hemiplegia during breast feeding, suggests a link between hormonal and hypothalamic mechanisms in migraine.

Differential Diagnosis and Associated Conditions

There are several conditions which can be confused with hemiplegic migraine—notably, cerebro vascular accidents, tumors, aneurysms, AV malformations, and epilepsy. Conversion hysteria may share some features of migraine[33].

Temporal arteritis and polymyalgia rheumatica manifest distinctive laboratory and clinical phenomena, distinguishing these syndromes from hemiplegic migraine. Other even less common conditions are Melkerssons' syndrome[34] which is accompanied by typical migraine but with transient complete peripheral facial palsy and lingua plicata; and benign orgasmic cephalgia, which occurs only with sexual climax[35].

A recently delineated clinical and radiographic entity has added another challenge to the differential diagnosis of hemiplegic migraine, that is, Moyomoya disease which closely mimics hemiplegic migraine. It occurs at all ages, mostly in children and women, characterized by recurrent headache of sudden onset associated with focal weakness leaving residue of varying degrees. Serial angiography in children discloses narrowing of the carotid bifurcation in the first stage, followed by development of a compensatory net of vessels at the base of the brain, the socalled "rete mirabile" hence the name Moyomoya, Japanese for hazy, "like a puff of smoke". Originally it was considered to be a disease exclusively of Japanese children. Other ethnic groups are vulnerable including African children.[36]

Most authors stress the following features which point to the diagnosis of hemiplegic migraine:

(1) history of previous attacks of migraine—and no history of cardiovascular disease;

(2) Family history of migraine;

(3) Prolonged aura in contrast to epilepsy, followed by a severe, throbbing headache. (Which does not have to be unilateral or contralateral to the limb symptoms.) Usually there is a history of limb symptoms and headache affecting the opposite side in previous attacks;

(4) Associated symptoms with typical migrainous visual disturbances (scintillating scotomata, hemiopia, photophobia);

(5) the entire episode rarely lasts more than 48 hours and the patient attains a complete recovery of function between attacks (with normal neurological exam);

(6) the headache is commonly accompanied by nausea, vomiting, siralorrhea, photophobia, and somnolence;

(7) there are no meningeal signs, cranial bruits, or papilledema;

(8) no loss of consciousness or focal seizures; and

(9) laboratory tests are normal, including skull Xray, EEG, spinal fluid examination, and EMI. EEG may be abnormal (30 percent) during or between attacks.

Friedman concludes from his study of over 10,000 patients with migraine, that "migraine is independent of the presence or absence of aneurysm or angioma"[29]. Of the two, the relationship of migraine to angioma has received the most attention. In a review of 43 cases of cerebral angioma, Olivecrona and Riives[37] found only one case with headaches indistinguishable from that of migraine. Mackenzie[38] found seven patients with migrainoid headaches in his review of 50 patients with cerebral angiomata. Of these seven, four had a cranial bruit. Lees'[39] study of 70 patients with cerebral angiomata revealed only 3 patients with migraine and in these, the headaches and focal symptoms always occurred on the same side.

Several interesting variations of complicated migraine have been reported in infants and children. Gascon and Barlow[40] reported on 4 patients ages 8 thru 16 years who presented with an acute confusional state. The diagnosis of migraine was made by the occurrence of headache and vomiting and a positive family and/or personal history of migraine. Verret & Steele[15] reported on 8 patients with migraine and alternating hemiplegia since infancy and childhood. In several patients the attacks required up to 3 weeks for complete resolution. Four patients *never* experienced headache and 4 patients had residual neurologic deficits (dyskinesias and mental retardation). All had a family history of migraine.

Role of Carotid Arteriography in Complicated Migraine

Although carotid arteriography is one of the most definitive tests in establishing a diagnosis of central nervous system disease, it is also one of the most dangerous. A review of the literature reveals a small but significant number of patients with complicated migraine who underwent carotid arteriography and had precipitation of another episode of hemiplegia or even permanent hemiparesis as a result of the procedure.[5,6,23,32,41–44]

In the review by Patterson et al.[41] of 26 patients with migraine who underwent arteriography at The New York Hospital between 1959 and 1962, five sustained transient complications and one suffered a permanent hemiparesis. They concluded that in patients with migraine headache, angiography "can be hazardous, particularly if performed during or soon after a headache." Pearce and Foster[45] studied 33 cases of complicated migraine with arteriography and exposed only two vascular malformations. They concluded that: "the investigation of hemiplegic migraine is liable to be fruitless . . . but that epileptic attacks occurring at the height of an attack of migraine or focal epilepsy and migraine with clinical features resulting from lesions in the same cerebral localization should be indications for angiography."

In a review of 220 vascular malformations diagnosed by carotid arteriography[46] 5 percent had a history of migraine which the authors note is about the same incidence of migraine in the general population. They set forth several guideline criteria for the use of angiography in migraine.

The most compelling problem in the management of hemiplegic migraine is this issue of arteriography. In recent years this decision has been simplified by the development of the EMI scan. In addition to EEG and skull x-ray examinations now the EMI scan will provide a comfortable margin of safety. In general, with normal non invasive test, arteriography can be circumvented.

However, the presence of a bruit or persistent focal signs justifies the risk of arteriography.

Therapy

Therapy for conventional migraine is directed toward preventing the secondary vasodilatation, the putative cause of the headache. Thus vasoconstrictors are usually prescribed, but often without benefit or with unpleasant side effects. However, in familial hemiplegic migraine, vasoconstriction, the probable cause of the focal neurological signs, should be avoided on theoretical grounds. This issue remains unresolved and according to Glista and others[47] familial hemiplegic migraine with high incidence in the families is rare, and nowhere is therapy for familial hemiplegic migraine noted. Their recent observations suggest that Propranolol offers promise as prophylaxis. Two out of 10 members of the family reported were protected from further attacks for nine and seven months. Further evaluation of Propranolol is recommended in the hope that the occasional serious sequelae from familial hemiplegic migraine can be prevented.

Summary

The semiology of paroxysmal familial hemiplegic migraine is stereotyped, characterized by a family history of classical migraine and migraine associated with focal neurological signs, that is hemiplegia, homonymous hemianopsia, aphasia, autotopagnosia, often associated with attacks of confusion and somnolence. Focal neurological signs may persist for days and rarely eventuate in fatality or permanent impairment. Transient cortical ischemia secondary to vasospasm of a major branch of the internal carotid artery, is the most plausible pathogenesis. Vasoconstricting drugs routinely used in classical migraine would theoretically exacerbate the focal cerebral ischemia. Thus, Propranolol prophylaxis might be a more plausible therapeutic approach. Further evaluation of this measure is needed.

The pedigrees of two families are reported, differential diagnosis outlined, and the role and risk of arteriography discussed.

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Bronchial Rupture in Closed Chest Injuries

JAMES T. STURM, M.D.*† and ALBERT MOWLEM, M.D., Ph.D.*

Two patients with blunt injury to the chest with resulting bronchial rupture are described. The features of this injury and the appropriate methods of management are discussed along with a review of the pertinent literature.

TRAUMATIC RUPTURE of a bronchus continues to pose problems because early diagnosis is often missed or delayed. The features of this injury are illustrated by the following two case reports and by review of the literature.

Case Reports

Case 1

A 23-year-old male was involved in an automobile accident four days prior to admission to this hospital and sustained closed injury to the chest. The patient had a left hemopneumothorax and was initially treated with a chest tube. Although the left lung expanded at first, complete atelectasis of the lung developed two days following injury and did not respond to intensive respiratory therapy. The patient was then transferred to this hospital. On examination he was in acute respiratory distress with a stable blood pressure. The chest roentgenogram demonstrated opacification of almost the entire left lung and the presence of mediastinal air (Figure 1). Bronchoscopy was carried out, and large amounts of secretions from the left main bronchus were aspirated, but the examination failed to identify the suspected bronchial disruption. Twelve hours later, bronchoscopy was repeated and revealed a laceration of the left main bronchus just below the carina. Bronchograms obtained at this time confirmed this finding (Figure 2).

Left thoracotomy then disclosed a small amount of blood in the pleural cavity. Dissection of the left main bronchus disclosed a five centimeter longitudinal full thickness laceration on its anterolateral aspect. The defect was repaired using interrupted 3-0 dacron sutures. A flap of pericardial fat pad was placed over the repaired defect. The lung then expanded fully. No other injuries were present in the chest.

The patient required a volume respirator for the next two days to maintain adequate oxygenation. The postoperative course was characterized by three episodes of localized atelectasis in the left lung. These complications responded to frequent tracheobronchial suctioning and to antibiotic therapy. The remainder of the hospital course was benign, and the patient made a rapid recovery with complete expansion of both lungs and was discharged 13 days following operation (Figure 3).

Comment

Late diagnoses of bronchial rupture are made often. The course of this patient emphasizes that even though the initial bronchoscopic examination did not reveal the bronchial tear, the repeat examination

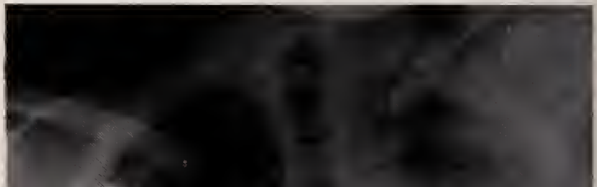

Fig. 1—(Case 1.) The left lung is essentially atelectatic, except for some air in the upper lobe region. Mediastinal air is seen just to the left of the trachea. A small chest tube is seen in the right chest and was present on admission.

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did, emphasizing the need for persistent efforts when there is a strong clinical indication: namely, the presence of mediastinal air and atelectasis. With an intrathoracic injury, the presence of air in the mediastinum can only come from injury to the respiratory tract or the esophagus. Repeat bronchoscopy and/or bronchograms are indicated if a patient with a chest injury continues to have persistent atelectasis of the lung or an air leak.

Case 2

A 16-year-old male automobile driver was brought to the hospital after his car collided with a tree. He arrived in frank respiratory distress manifested by severe dyspnea and cyanosis. He had a severe crushing non-penetrating injury of the chest and a large tension hemopneumothorax was present on the right side. A chest tube was placed for suction. A massive air leak was immediately detected. Measurement by spriometer showed the leak to be approximately 1200 ml. per breath during forced ventilation by the anesthesiologist after endotracheal intubation. Bronchoscopic examination at this time demonstrated complete transection of the right main bronchus distal to the take-off of the upper lobe bronchus.

A right thoracotomy was performed immediately. A moderate hematoma was present in the hilar area. Some small tears of pulmonary parenchyma were present. The right main bronchus was dissected and the complete horizontal transection identified two centimeters distal to the carina. Minimal debridement of the torn edges was necessary and end-to-end anastomosis of the ends of the bronchus was accomplished using interrupted 3-0 dacron sutures. It is of interest that the adjoining pulmonary artery and pulmonary veins were not injured. No other injuries were present within the thorax.

Postoperatively the patient required a volume ventilator for respiratory support for a few days. A small air leak was manifest postoperatively, but gradually sealed six days after operation. The patient had multiple episodes of atelectasis requiring several bronchoscopic aspirations of retained secretions. Gram negative rods grew on culture from the tracheal aspirates and these responded to treatment with appropriate antibiotics.

Three weeks following operation a small pneumothorax was evident on chest roentgenogram, which required re-insertion of a chest tube. A small air leak was present even though the right lung appeared to be expanded. Bronchoscopy showed the line of anastomosis to be sealed and to be healing. The patient developed a small empyema, which required the presence of an open chest tube for drainage with the lung still well expanded. He responded well to antibiotic treatment. The chest tube was removed gradually over a period of three months in the outpatient clinic. The lung has remained well expanded since then. Two years later, because of a mild cough, bronchoscopy was carried out and a single dacron suture was found to be protruding into the normal sized lumen of the bronchus at the level of the anastomosis. This was removed without difficulty.

Comment

This patient illustrates an early massive air leak from a completely transected bronchus requiring immediate primary repair.

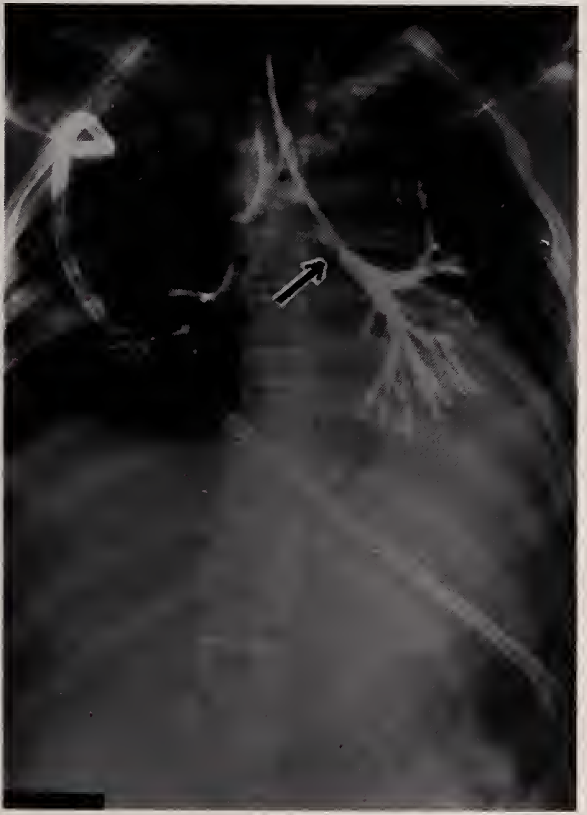

Fig. 2—(Case 1.) Bronchogram shows the contrast material in the middle of the left main bronchus in a narrowed zone (arrow) caused by infolding of the tear in the wall of the bronchus. The 5 cm. longitudinal tear found at operation is not fully demonstrated in this film.

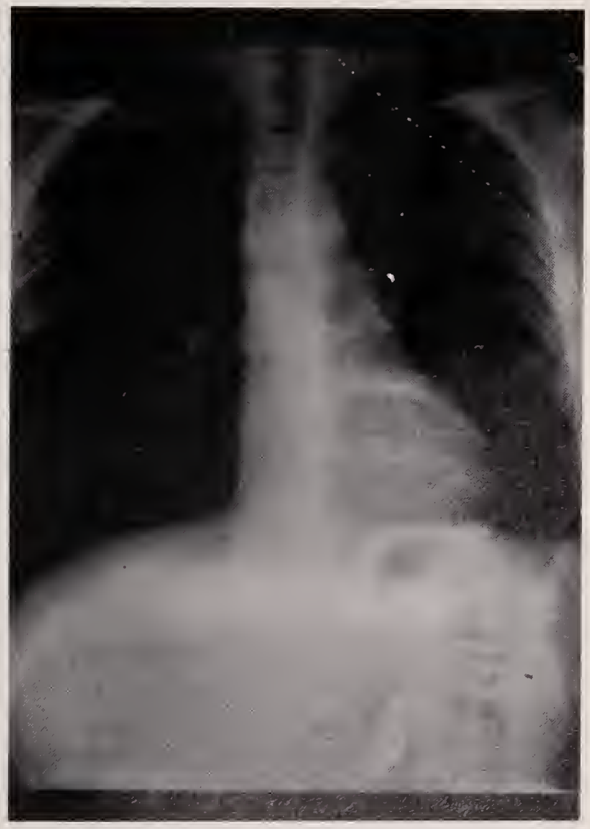

Fig. 3—(Case 1.) The chest x-ray appearance at the time of discharge from the hospital. The lungs are well expanded.

Discussion

Traumatic rupture of the bronchus was first reported by Winslow as a healed lesion in a wild duck in 1871.[1] Seuvre[2] described the first human case in 1873 in a patient who died. Vierheilig[3] repaired a rupture of a bronchus in 1914 but the patient died following the operation. The first survivor from this injury was reported in 1928.[4] This was a woman who died 21 years after severe chest trauma and at autopsy was found to have a completely fibrosed right main bronchus. Subsequent to 1942, some patients with bronchial rupture recovered following tube decompression of a pneumothorax. In these cases the lung remained atelectatic. In 1949 Griffith[5] reported the first successful delayed repair of a ruptured bronchus. The operation was performed several months following injury. The first immediate successful primary repair was described by Scannell[6] in 1951.

Although dyspnea and hemoptysis are common symptoms following rupture of the bronchus, the cardinal features of this injury include a voluminous air leak or failure of the lung to re-expand following decompression of a pneumothorax. Eijgelaar[7] reported that 30% of patients with bronchial rupture do not have pneumothorax because the mediastinal pleura may remain intact when a mainstem bronchus is torn. In these cases, pneumomediastinus is usually demonstrable on the chest Xray and subcutaneous emphysema may be palpable in the neck and chest wall.

These injuries generally result from high velocity motor vehicle accidents. Most injuries involve the mainstem bronchus, the right more frequently than the left. Hood[9] noted that associated major injuries are present in only half the cases.

Four theories are generally offered to explain the mechanisms by which bronchial disruption occurs: (1) hyperextension of the cervical trachea shearing the main bronchus from the trachea at or near the carina; (2) the bronchial rupture occurs following compression between the sternum and the vertebral column; (3) explosion of the bronchus occurring because of forced expiration against a closed glottis; (4) shearing forces transecting the bronchus when the pendulous lung continues to move away from a fixed trachea during rapid deceleration.

In the series of bronchial tears reported by Burke[8] in 1962, the correct diagnosis was not made until septic atelectasis occurred in 58% of patients. Hood[9] showed that 30% of ruptures are identified in the first 24 hours, 10% during the first week, and 60% later than the first week following injury. In 40% of patients, the diagnosis is made later than one month following injury. Sorensen[10] reviewed 59 cases in 1960 and found that eight patients underwent surgical repair on the day of injury, while 33 patients had a long delay in their diagnosis and required resection of a bronchial stricture with re-anastomosis at a later date.

In closed chest injuries, Collins[11] has recently recommended that no operative repair be undertaken if the bronchoscopic examination demonstrates the lesion to involve less than one-third the circumference of the bronchus, and if at the same time intercostal tube suction results in complete and continued re-expansion of the lung with cessation of the air leak. If the bronchial rupture is complete, immediate primary repair should be carried out with minimal debridement of the bronchial edges. Occasionally a bronchoplastic procedure is not possible in the late cases and pneumonectomy may be necessary for a lung that is essentially destroyed.

Traumatic rupture of the bronchus is a well known entity, but its early diagnosis is commonly overlooked. Surgeons dealing with trauma should readily perform bronchoscopy in patients with chest trauma who have a pneumothorax in which the lung fails to re-expand fully following tube thoracotomy. This is especially true in patients with pneumothorax and extensive air leaks.

Although the incidence of esophageal tears in closed chest injuries is rare indeed, it must be remembered that the presence of mediastinal air may also be due to esophageal injury and appropriate diagnostic and therapeutic measures must be undertaken if this particular injury is suspected.

References

1. Winslow, WH, cited by Kinsella, TL: The Development of Thoracic Surgery in the Upper Mid-West. Minnesota Med 55:34, (Suppl 2), August, 1972
2. Seuvre, cited by Kinsella, TL: (see above)
3. Vierheilig, J: Die Subkutane Bronchuszerreissung. Beitr Klin Chir 93:201, 1914
4. Krinitzke, SI: Kasuistik Einer Vollstandigen Zereissung des Rechten Luftrohrenastes. Virchows Arch f Path Anat 266:815, 1928
5. Griffith, JL: Fracture of the Bronchus. Thorax 4:105, 1949
6. Scannell, JG: Rupture of the Bronchus Following Closed Injury to the Chest. Ann Surg 133:127, 1951
7. Eijgelaar, A and Homan van der Hyde, JN: A Reliable Early Symptom of Bronchial or Tracheal Rupture. Thorax 25:120, 1970
8. Burke, JF: Early Diagnosis of Traumatic Rupture of the Bronchus JAMA 181:682, 1962
9. Hood, RM and Sloan, HE: Injuries of the Trachea and Major Bronchi J Thorac and Cardiovas Surg 38:458, 1959
10. Sorensen, HR: Traumatic Rupture of the Main Bronchus. Acta Chir Scand 119:346, 1960
11. Collins, JP, Ketharanathan, V and McConchie, I: Rupture of Major Bronchi Resulting from Closed Chest Injuries. Thorax 28:371, 1973

One Year of Heparin Anticoagulation

An Ambulatory Subject Using a Totally Implantable Infusion Pump

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RICHARD L. VARCO, M.D., PH.D.,[‡] & HENRY BUCHWALD, M.D., PH.D.[#]

The goal of long-term continuous intravenous heparin anticoagulation has now been achieved in an ambulatory subject for one year using a totally implantable infusion pump. The pump was implanted subcutaneously under local anesthesia in the subclavicular fossa of the patient, a 35 year old female, with recurrent thrombophlebitis. The delivery catheter was threaded into the superior vena cava via the axillary and cephalic veins. Circulating heparin levels were maintained persistently between 0.1 and 0.3 units/ml of plasma during the year of infusion. No hemorrhagic or thromboembolic episodes occurred, nor did thrombocytopenia or osteoporosis. No complications or side effects occurred, except a pump pocket effusion which resolved spontaneously, and the development of minor alopecia. The patient was able to maintain normal work and recreational activities while the pump was implanted. The pump was electively explanted after a year of therapy, when it was believed that the probability of further thrombotic occurrences had markedly diminished. This study demonstrates the implantability and satisfactory performance of the pump and the feasibility of long-term continuous intravenous heparin anticoagulation.

CHRONIC LONG-TERM anticoagulation is a therapeutic objective in the management of a variety of clinical disorders, including: recurrent venous thromboembolism, systemic arterial thrombi, transient ischemic attacks, and cardiac disease resulting in placement of valve prostheses and heart transplantation. Theoretical considerations,[1] experimental evidence,[2–4] and clinical experience[5,6] indicate that heparin is the most effective anticoagulant clinically available today. Furthermore, the comparative safety and efficacy of heparin administration by continuous intravenous infusion were demonstrated recently in two prospective clinical trials.[7,8] Despite its desirability as a therapeutic alternative, long-term heparin anticoagulation by continuous intravenous infusion has not, heretofore, been practiced in ambulatory subjects for two reasons: firstly, and most importantly, no acceptable means of accomplishing continuous intravenous delivery on a long-term basis was available and, secondly, fears of the anticipated complications—hemorrhage, thrombocytopenia and osteoporosis[9]—were discouraging. The development

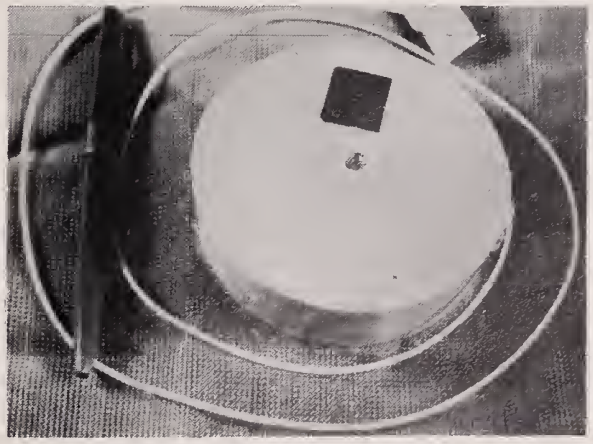

Fig. 1—Implantable Infusion Pump. Dimensions: 2.82 cm in height x 7.95 cm in diameter. Empty weight is 235 g.

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of a totally implantable infusion pump (Figure 1, Infusaid®, Metal Bellows Corporation, Sharon, Massachusetts) in our laboratory at the University of Minnesota enabled us to achieve protracted heparinization by continuous intravenous infusion and to study the complications and side effects of this mode of therapy.

Design

The theoretical basis for the implantable infusion pump concept and the details of the pump model currently in use have been previously published.[10-13] Briefly, our pump is a hollow disk separated into two chambers by a bellows. The drug is expelled from the inner chamber through a bacterial filter, pressure drop mechanism, and delivery catheter by vapor pressure from a volatile liquid sealed in the outer chamber. The inner chamber of the pump can be refilled by a needle injection through a self-sealing septum, simultaneously compressing and condensing the vapor in the outer chamber and recharging the pump for the next infusion cycle. The casing and bellows of our current pump model are constructed of titanium with a stainless steel capillary pressure drop mechanism, silicone rubber septum, catheter, and outer coating, and Teflon® (polytetrafluoroethylene) needle stop.

Pre-Clinical Testing

To establish the *in-vivo* performance of our device and to monitor for possible complications or side effects of long-term heparinization, we conducted a study of chronic heparin infusion in the dog. The results of this study were published following six months[12] and one year[13] of continuous heparin infusion. Some animals have now been heparinized for greater than three years. Our study demonstrated the ability of the pump to maintain satisfactory levels of circulating heparin and established the feasibility of the *in-vivo* refill technique. It further showed that while statistically demonstrable changes in bone mineral density did occur, these were not of sufficient magnitude to cause any clinically significant effects, i.e. fractures. Additionally, bone mineral density values were not significantly ($p<0.05$) different than those of control animals suggesting the possible involvement of inactivity or diet on the observed changes. Hemorrhage occurred on a number of occasions, but these were generally minor and associated with venipuncture or pump sites, suggesting that the incidence of these might be reduced by more meticulous care in blood sampling and pump refilling. No evidence of thrombocytopenia or any other side effects was observed. The success of our animal studies led us to initiate a clinical trial of chronic heparin infusion in the treatment of thromboembolic disease.

Clinical Studies

Methods

In a continuing clinical trial at the University of Minnesota, ambulatory subjects with severe or recurrent thromboembolic disorders are being treated with continuous intravenous heparin infusions from implanted pumps. The infusion pumps are calibrated in the laboratory of the manufacturer and each is equipped with a set of flow volume and drug delivery curves to facilitate computation of the concentration of drug to be placed in the pump for the desired delivery. Sterilization is performed at the University of Minnesota by autoclaving at 121°C for 45 minutes. Prior to pump implantation, the following baseline determinations are performed: Venous (Lee-White) clotting time (LWCT),[14] activated partial thromboplastin time (APTT),[15] thrombin time (TT),[16] white blood cell count, platelet count, hemoglobin, hematocrit, serum alkaline phosphatase,[17] serum Ca++,[18] serum inorganic phosphate,[19] and bone mineral density (BMD).[20] Additionally, in-vitro standard curves of TT and APTT vs heparin concentration are prepared using the patient's plasma. Each patient's heparin requirement is established, preoperatively, by administering heparin by continuous infusion using an extracorporeal infusion pump

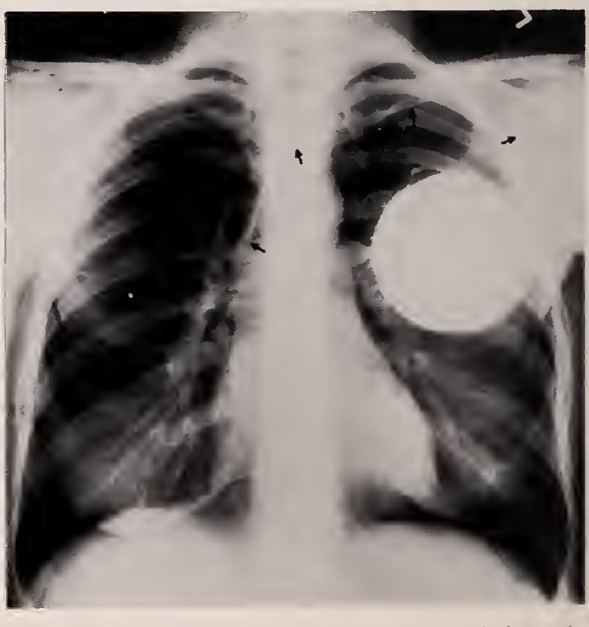

Fig. 2—Radiograph of an implanted pump. Arrows designate the pump's radiopaque catheter in place.

and noting the amount of heparin required to maintain the patient's coagulation parameters in the desired range.

Immediately before implantation each pump is filled aseptically with 45 ml of sterile bacteriostatic water. A subcutaneous pocket is dissected in the subclavicular fossa, under local anesthesia, and the delivery catheter is threaded through the cephalic and axillary veins into the superior vena cava under direct fluoroscopic observation (Figure 2). The pump is inserted into the pocket and secured to the underlying fascia using a circular polypropylene mesh tab. The wound is then closed and dressed.

After the wound has been allowed to heal for two to three days, each pump is filled with sodium heparin at a concentration designed to maintain the circulating heparin level at 0.2 units/ml of plasma. Adjustments in heparin delivery are made, as needed, by changing the heparin concentration in the pump. Circulating heparin level is calculated using the in-vitro TT vs heparin concentration standard curve. After release of the patient from the hospital, generally five to 10 days after implantation, coagulation and hematologic parameters are performed weekly and blood chemistry and BMD analyses are performed monthly. Each pump is refilled by a percutaneous needle injection as often as needed, depending on the heparin requirement of each patient. For most patients the interval between refills is from one to three months.

Results

Our first clinical subject, a 35 year old female with recurrent thrombophlebitis, was anticoagulated as an ambulatory patient for one year. When wound healing from the implantation was complete the patient was able to return to her normal work and recreational schedule. During the year of infusion, circulating heparin levels (Figure 3D) were maintained persistently between 0.1 and 0.3 units/ml of plasma. While plasma heparin levels remained essentially constant, APTT values increased gradually throughout the year (Figure 3C). The patient experienced no further thrombotic incidents nor any hemorrhagic episodes following initiation of heparin therapy. No changes in platelet count (Figure 3A) were observed nor did noteworthy changes occur in bone indices: BMD (Figure 4A), serum Ca++ (Figure 4C), serum inorganic phosphate (Figure 4C), and serum alkaline phosphatase (Figure 4B).

The clinical course was uncomplicated except for a pump pocket effusion accompanied by elevated coagulation parameters (Figures 3, C and D) which occurred following a pump refill at the end of the

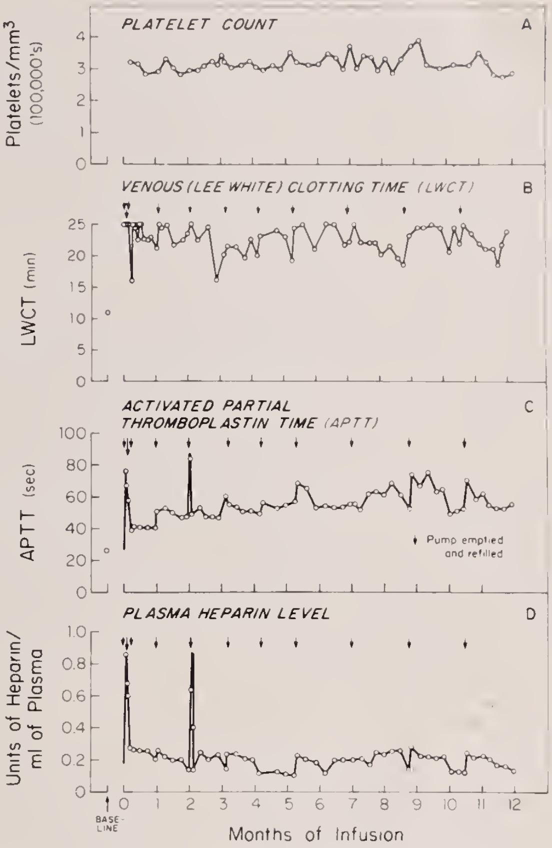

Fig. 3—Coagulation and Hematologic indices.

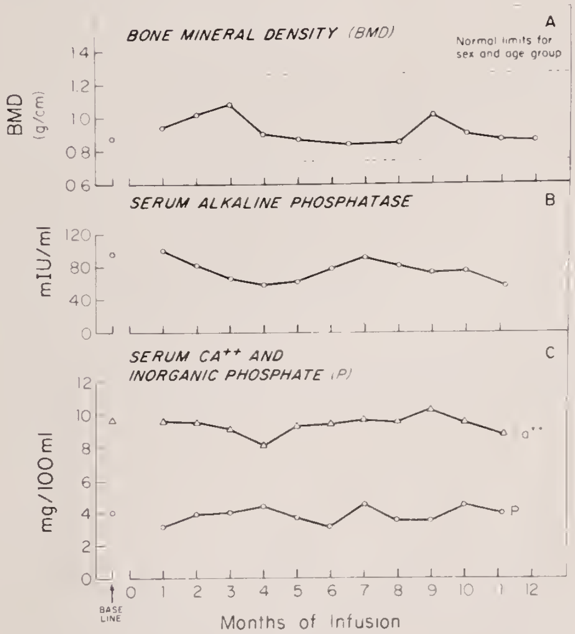

Fig. 4—Bone indices.

second month of infusion. A small amount of concentrated heparin was probably released into the subcutaneous tissues during the filling procedure. The excess circulating heparin was immediately neutralized with protamine sulfate and the effusion resolved spontaneously with no treatment other than pressure bandaging. No observable side effects accompanied the heparin treatment except the development of minor alopecia.

At the end of one year of infusion, heparin was removed from the pump, and the patient monitored for an additional month for possible recurrence of thrombotic problems. During this period the in-vitro APTT vs heparin concentration standard curve was repeated and compared with the corresponding baseline curve and a curve using normal plasma (Figure 5). The post-therapy curve was observed to be substantially upward and to the left of that prepared prior to therapy and nearly identical to the normal curve. When no evidence of thrombosis was observed one month after therapy was discontinued, the pump was explanted under local anesthesia.

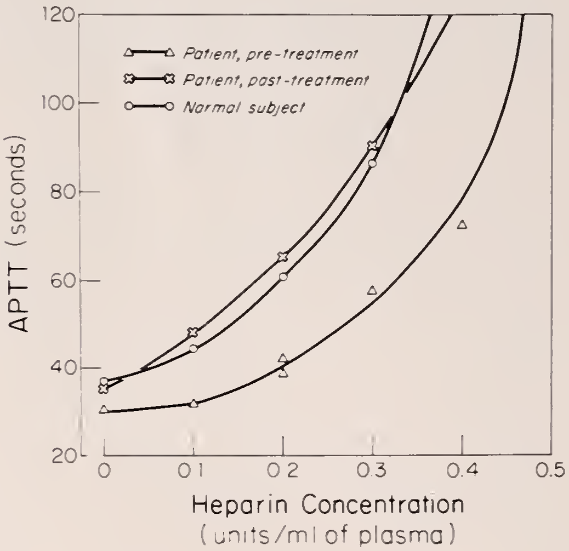

Fig. 5—In-vitro heparin in plasma vs APTT standard curves made using the patient's plasma before and after protracted heparin therapy and using plasma from a normal subject.

Discussion

The achievement of one year of continuous intravenous heparinization in an ambulatory patient demonstrates the long-term clinical implantability and satisfactory performance of the implantable infusion pump. Circulating heparin levels were maintained within acceptable limits, as evidenced by appropriately prolonged coagulation indices. Hemorrhage, thrombocytopenia, and osteoporosis complications associated with heparin therapy, did not occur, nor were there recurrences of thrombophlebitis or other thrombotic phenomena.

The gradual elongation of the APTT during the course of therapy despite the maintenance of relatively constant circulating heparin levels, and the shift upward and to the left of the APTT vs heparin concentration standard curve after completion of one year of therapy, suggest a favorable change in the concentrations of plasma coagulation factors. Elevated levels of procoagulants are generally associated with a thrombotic tendency and are usually manifest in shortened PTT values.[21] The changes in APTT values which we observed may, therefore, be associated with a diminishing probability of thromboembolism and suggest that a basic therapeutic benefit may have been derived from the prolonged heparinization.

Summary

Protracted continuous intravenous heparin anticoagulation has been maintained in an ambulatory subject for one year without serious complications or side effects and without recurrence of thromboembolic phenomena. The above results demonstrate the technological feasibility of prolonged ambulatory heparin infusion and suggest that it can be done safely and with therapeutic benefit. Studies for further evaluation of outpatient heparinization as a therapeutic alternative are continuing at the University of Minnesota.

Acknowledgment

The substantial contribution of Patricia H. Bordewich in performing the clinical laboratory studies and in managing outpatient services for the project is gratefully acknowledged.

References

1. Koller F. The physiological function of heparin. Thrombos Diathes haemorrh (Stuttgart) 33:17, 1974
2. Hoak JC, Connor WE, Warner ED: The antithrombotic effects of sodium heparin and sodium warfarin. Arch Intern Med 117:25, 1966
3. Carey LC, Williams RD: Comparative effects of dicoumarol, tromexan, and heparin on serum-induced venous thrombosis. Ann Surg 152:919, 1960
4. Wessler S, Morris LE: Studies in intravascular coagulation IV. The effect of heparin and dicumarol on serum-induced venous thrombosis. Circulation 12:553, 1955
5. Anlyan WG, Hart D: Special problems in venous thromboembolism. Ann Surg 146:499, 1957
6. vanVroonhoven TJMV, vanZijl J, Muller H: Low-dose subcutaneous heparin versus oral anticoagulants in the prevention of postoperative deep-venous thrombosis. A controlled clinical trial. Lancet 1:375, 1974
7. Salzman EW, Deykin D, Shapiro RM, Rosenberg R: Management of heparin therapy. Controlled Prospective Trial. N Eng J Med 292:1046, 1975.
8. Glazier RL, Crowell EB: Randomized prospective trial of continuous vs intermittent heparin therapy. JAMA 236:1365, 1976.
9. Gervin AS. Complications of heparin therapy. Surg Gyn & Ob 140:789, 1975.

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Safe Prophylactic Perioperative Use of Anticoagulants

J. ERNESTO MOLINA, M.D.*

Abstract

A series of 292 consecutive patients undergoing major surgery were classified in two groups according to their expected tendency of developing perioperative venous thromboembolic phenomena. A 10 risk factor criteria was followed: Group I (247 patients) considered low-moderate risk patients and Group II (45 patients) of high risk. Each group was submitted to different perioperative prophylactic anticoagulant schedule. Schedule I used in Group I consisted in administration of subcutaneous low doses of Heparin before and after surgery. Schedule II used in Group II included, in addition to the use of Heparin, administration of Low Molecular Weight Dextran, also before and after surgery. The incidence of pulmonary embolism in Group I was 0.4%, and 2.2% in Group II. The incidence of detectable venous thrombosis was zero in both groups. No complications resulted from the use of anticoagulants.

PROPHYLACTIC USE of small doses of subcutaneous Heparin, before and after surgery, was first recommended by Sharnoff[1-2] and found to be highly effective in the prevention of perioperative deep venous thrombosis.[3-6]

Dextran also has been found of practical use for its anticoagulant properties in the prevention of pulmonary embolism (PE), particularly in orthopedic surgery.[7-9] Although precautions must be observed during the use of Dextran, its effectiveness seems to be superior to Warfarin or Aspirin which are more difficult to control, and are associated with more complications.[10-12] Several risk factors have been recognized that are associated with an increased incidence of deep vein thrombosis (DVT) and pulmonary embolism (PE). In the present study, a group of patients undergoing major surgery was divided into two categories depending on the risk factors present. Both groups were then treated by different anticoagulation schedules.

Material and Methods

Two hundred and ninety two consecutive patients were classified in two groups according to ten risk factors (Table 1) adapted from Atik.[7] These were applied to the entire group except patients with a proven history of previous venous thrombosis or pulmonary embolism. When these latter two conditions were present, the patients automatically were placed in a high risk group.

TABLE 1

Risk Factors in Thromboembolic Phenomena*

Old Age
Immobilization
Extensive operation
Hemoconcentration
Systemic Infections
Obesity
Trauma and fractures
Malignancy
Dehydration
Cardiac Disease

*Modified from Atik et al.[7]

Group I:

This group consisted of 247 patients considered to have a low or moderate risk for thromboembolism. They were assigned into this group if they had less than three risk factors present and no previous history of DVT or PE. This group of patients underwent several types of major surgical procedures divided in four categories (Table 2).

Group II:

Patients were considered to be in the high risk if they had one of three conditions or a combination of them: (a) previous thrombophlebitis (b) previous episode of pulmonary embolism and (c) a combination of three or more risk factors present (Table 1). This group was comprised of 45 patients and was also divided into four categories by the type of surgical procedures (Table 3).

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Anticoagulants Schedules

Two different schedules of prophylactic anticoagulation were used.

Schedule I:

Patients in the low-moderate risk group were given Heparin 10,000 U subcutaneously three to four hours before surgery and continued with 2500 to 5000 U subcutaneously every 6 hours after surgery for five to seven days or until patient was fully active. In the postoperative period Heparin was restarted within the first 6 hours after the operation was completed. The schedule 6-12-6-12 hours was preferred for better convenience in keeping records and easier control by the nursing personnel. The dose of Heparin depended on the size of the individual. If the patient's weight was less than 60 Kg., Heparin 2500 U was given every 6 hours; patients weighing more than 60 Kg. received Heparin 5000 U. The preoperative dose of Heparin was 10,000 U regardless of their weight.

TABLE 2
Group I (Low-Moderate Risk Patients)
Operative Procedures

Abdominal	
Hemicolectomy	15
Abdominal exploration (with or without Peritonitis, small or large bowel resection, exteriorization)	33
Gastric resection (Ca or ulcus)	14
Biliary surgery (all types)	9
Incisional hernia (large)	6
Vascular	
Aortoiliac, aortofemoral bypass	12
Femoropopliteal bypass	11
Lower limb amputation	4
Linton procedures (leg ulcer)	5
Aortic aneurysm and other procedures	8
Thoracic and Thoracoabdominal	
Esophagogastrectomy	4
Colon interposition	6
Thoracotomy with or without lung resection	28*
Thoracic aortic aneurysm	2
Chest wall resection	6
Epicardial pacemaker	9
Pericardiectomy	5
Cardiac	
Coronary artery bypass	41
Valve replacement	28
Congenital	1
Total	247

---

*One patient with pulmonary embolism.

TABLE 3
Group II (High Risk Patients)
Operative Procedures

Abdominal	
Cholecystectomy & CBD Exploration	1*
Suprapubic prostatectomy	1
Vascular	
Aortoiliac bypass	2
Femoropopliteal bypass	3
Linton procedure (leg ulcer)	2
Thoracic and thoracoabdominal	
Esophagogastrectomy	2†
Esophageal resection	3
Colon interposition	2
Hiatal hernia	6
Thoracotomy with lung resection	11
Thoracotomy with chest wall procedure	6
Total	45

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*See text.
†One patient with pulmonary embolism.

Schedule II:

In the high risk patient group Heparin was administered as in Schedule I, but Low Molecular Weight Dextran (LMD) was also given intravenously at the dose of 10 to 15 ml per kilogram per 24 hours the day of surgery. The LMD was started before the induction of anesthesia and continued throughout the surgical procedure. Postoperatively 250 to 300 ml of LMD were given for three days. The rate of administration was regulated in accordance with the urine specific gravity and its volume as proposed by Thomas et al.[13] Since the administration of Dextran may also lead to circulatory volume overload and to alterations of clotting mechanism potentiated by the use of Heparin, the central venous pressure was routinely monitored as long as LMD was being infused. Partial thromboplastin time (PTT) and protimes were done and 24 hours creatinine clearance obtained. Other prophylactic routines used in both groups were: (a) Use of antacids every two hours while patient is awake. This was done before surgery and after as long as the patient remained in the hospital. (b) The patient's position in bed, before and after surgery, was maintained flat with only 15 degrees of head elevation being allowed on occasions. No sitting was allowed except for meals. (c) Early mobilization was started the first or second day of surgery.

Results

The results are analyzed for occurrence of pulmonary embolism (PE), development of venous thrombosis (DVT) and for complications due to the prophylactic anticoagulation.

Group I:

Of the 247 patients in Group I, there was only one occurrence of pulmonary embolism demonstrated clinically and by lung scan. This embolic episode occurred the 5th postoperative day following a middle lobectomy. Bilateral lower extremities venography was negative and no clinical symptoms of DVT were observed.

Lung scans were done in 45 patients in addition to the case already discussed. All failed to show findings consistent with pulmonary embolism. The patient with the single episode of PE recovered with conservative treatment and no other complications occurred. A total of 18 venographies were done in the entire group of patients for suspicion of venous thrombosis with none showing the presence of thrombosis.

No episodes of bleeding related to the use of Heparin occurred. Partial thromboplastin times (PTT) values obtained during the course of the Heparin prophylaxis did not show significant deviation from the normal range.

Group II:

A total of 45 patients were classified and treated as high risk individuals. One case of pulmonary embolism was documented. A total of 25 lung scans were done in the entire group. With the exception of the single case reported, all the rest were negative. A total of 12 postoperative venographies were done in this group. All were reported free of thrombi or not showing evidence of change from previous preoperative venographic study.

No complications from the use of prophylactic anticoagulants were recorded in this group. The prophylactic heparinization was used in two patients with known previous peptic ulcer disease and no complications occurred.

The only event that may be related to the use of LMD occurred in a patient who had large amounts of sanguinous chest drainage following a repair for hiatal hernia and partial pulmonary decortication. The amount of drainage decreased and finally stopped within 24 hours after the infusion of Dextran was discontinued. No blood transfusion became necessary.

Discussion

The usefulness of prophylactic administration of Heparin has been previously demonstrated.[1,3-6] Some patients however represent higher risks for thromboembolic complications than others. Therefore a high risk group may not be sufficiently protected from thromboembolism by only the use of subcutaneous Heparin. One example is given by the patients undergoing hip[13] surgery, in whom Heparin alone does not seem to be effective. The present group of patients was classified into two groups providing additional protection for the high risk group with the use of Dextran.

It would appear that with a carefully monitored plan of anticoagulants, most of the cases can be handled safely. Anaphylactic reactions related to the use of Dextran were not observed in this group of patients. Renal insufficiency problems were avoided, it is believed, by the use of the regimen suggested by Thomas et al.[13]

Dextran is known to potentiate the effects of Heparin, prolonging the PTT values above the normal. With the use of Heparin alone, the PTT values are almost always in the normal range and the risk of bleeding is extremely low. However with the use of Dextran, the PTT as well as the PT should be checked more frequently during the three days in which both drugs are given simultaneously. Work presented by Hint[14] has shown that the amount of Dextran to be administered every day should be less than 500 ml, often 200 to 300 ml. Larger amounts lead to accumulation of Dextran in the circulation, and does not add any further beneficial effects. In the present study there were no patients considered too old or too weak and debilitated who could not tolerate administration of anticoagulants. On the contrary, these are the patients more prone to develop venous thromboembolic phenomena and who need the prophylactic use of anticoagulants. It is believed after the present experience that the prophylactic use of anticoagulants, following the methods here described, is a safe and successful method to prevent perioperative venous thrombosis and pulmonary embolism. The true incidence of venous thrombosis in the present study is unknown because there was no routine practical screening method available to be applied to every patient. Venographies were obtained in the suspicious cases. However, since there was one case of pulmonary embolism in each group of patients, we can assume that there were cases of undetected DVT. Clinically there were none detected, which compares favorably with the expected incidence of 20 to 30 percent found in untreated cases followed only clinically.[10,12] In patients considered as a moderate risk for thromboembolic complication, the true incidence of pulmonary embolism is not known. Greep, Mathis and Chalmer, quoted by Salzman,[10] give some figures in patients undergoing general or gynecological surgery. The incidence of PE ranges from 2.1 to 6 percent, and because these are retrospective studies, the figures probably fall short. In the group of patients considered high risk, in the same publication,[10] incidence ranges from 10 to 26.5 percent. The results of the present study compare favorably showing only 0.5 percent of PE in the moderate risk group and 2.2 percent in the high risk group. Although the present study has the limitations of being a personal consecutive series of patients operated on by the author, it does show the safety of the prophylactic approach to the problem of venous thromboembolic disease that accompanies any major surgical procedure.

The author wishes to thank Dr. Demetre Nicoloff, M.D., University of Minnesota for his invaluable help in reviewing this work.

References

1. Shamoff, JG, Kass, HH, Mistica, BA. A plan of Heparinization of the surgical patient to prevent postoperative thromboembolism. Surg Gyn & Obst 115:75, 1962
2. Shamoff, JG: Results in the prophylaxis of postoperative thromboembolism. Surg Gyn & Obst 123:303, 1966.
3. Gallus, AS, Hirsh, J, Tuttle, RJ, Trebilcock, R, O'Brien, SE, Carroll, JJ, Minden, JH, Hudechi, SM. Small subcutaneous doses of Heparin in prevention of venous thrombosis. New Eng J Med 288.545, 1973.
4. Gordon-Smith, IC, Grundy, DJ, LeQuesne, LP, Newcombe, JR, Bramble, FJ: Controlled trial of two regimens of subcutaneous Heparin in prevention of postoperative deep-vein thrombosis. Lancet 1:1133, 1972.
5. Kakkar, VV, Corrigan, T, Spindler, J, Fossard, DP, Flute, PT, Crellin, RQ Efficacy of low doses of Heparin in prevention of deep vein thrombosis after major surgery. Lancet 2:101, 1972.
6. Williams, HT: Prevention of postoperative deep vein thrombosis with perioperative subcutaneous Heparin. Lancet 2:950, 1971.
7. Atik, M, Harkness, JW, Wichman, H: Prevention of fatal pulmonary embolism Surg Gyn & Obst 130:403, 1970.
8. Evarts, CM, Alfidi, RJ: Prevention of thromboemholic disease after elective surgery of the hip. J Bone Joint Dis 53-A.1271, 1971.
9. Jansen, H Prevention of venous thrombosis Lancet 1:838, 1970.
10. Salzman, EW, Harris, WH, DeSanctis, RW. Anticoagulation for prevention of thromboembolism following fractures of the hip. New Eng J Med 275.122, 1966
11. Salzman, EW, Harris, WH, DeSanctis, RW. Reduction in venous thromboembolism by agents affecting platelet function New Eng J Med 284:1287, 1971
12. Sevitt, S, Gallagher, NG: Prevention of venous thrombosis and pulmonary embolism in injured patients Lancet 2:981, 1959
13. Evarts, CM, Alfidi, RJ Thromboembolism after total hip reconstruction. Failure of low doses of Heparin in prevention. JAMA 225.515, 1973.
14. Hint, H. Dextran and Thrombosis. Panel discussion Acta chir. Scand (Suppl.) 387:130, 1968

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One year ago the physicians of Minnesota were the object of an almost desperate fund raising effort by the Foundation of the Minnesota State Medical Association. For 20 years the Foundation, through its Student Loan Fund, has been making loans to medical students in need. The combination of circumstances that made the drive necessary was the inevitable increase in the cost of medical education, together with the shrinking of traditional sources of student support. This resulted in a student loan fund with many requests for assistance, but with depleted resources for response. The generosity of Minnesota physicians turned the situation around. The Foundation was able to honor every request made to it for help.

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Laboratory Letter

Autumnal Malaria

CHARLES W. JARVIS, M.D.*

HE WAS SMALL, black and seven-months old when his mother brought him into the Emergency Room late on a Saturday afternoon in November. She said that he had been coughing and "congested" for three days, his appetite had disappeared, his nose was "running" and he was lethargic. She also said that she had found a worm in his older brother's stool the previous day.

Physical examination revealed a small, black child whose ears, throat and chest were negative. The only positive physical findings were rhinorrhea and a palpable spleen. The chest Xray was negative; the hemoglobin was 6.7 gm/100 ml.

Because he was black, the obvious tests such as sickle cell screening and glucose-6-phosphate dehydrogenase activity were done first. They were negative. Total iron and iron binding capacity were within normal limits. The haptoglobin was low (21 mg/dl), and the reticulocyte count was elevated (17.4%) indicating a hemolytic anemia. The peripheral blood smear had already been looked at during the differential count, but because it was handy and is almost always a source of a great deal of useful information, several stained blood smears were examined again. There, tucked away within the cytoplasm of a small percentage of the red cells, were the typical ring trophozoites of malaria. After the first few were recognized, first with skepticism, then with mounting excitement, it became apparent that many of the red cells were parasitized. If the eye-brain search pattern had been working properly, the parasites would have been recognized earlier. But who expects malaria in Minnesota, especially in the winter? On the first several smears that were examined neither merozoites nor gametocytes were seen, a factor which strongly suggested falciparum malaria. After therapy was begun, the banana-shaped gametocytes of falciparum showed up in the peripheral blood.

Prior to the Civil War, malaria was frequently found as far north as southern Canada.[1] In the last third of the 19th century wealthy southerners vacationed at such places as Lake Minnetonka and Red Wing in an attempt to escape the summer heat and the malaria of their home communities. Malaria was known to exist near the Arctic Circle in Siberia during the nineteen twenties and was considered an endemic disease in the continental United States until the late nineteen forties. But it is not necessary for a disease to be endemic in an area for it to present itself as this one did, unannounced and unwelcome. Ever since World War II, a third of a century ago, it has been obvious that the airplane can deliver almost any infectious disease to almost any city in the world.

It is also interesting that despite our recent, concentrated exposure to tropical disease in Vietnam, few clinicians in the upper Midwest think of malaria as a cause of hemolytic anemia. The fact that this child, his mother and siblings had just arrived from Zaire and that the medical history had to be obtained through an interpreter merely confused the issue. After the diagnosis was finally made in the laboratory and treatment with chloroquin was begun, the mother volunteered the information that the baby had been treated for malaria several months before the family left Zaire.

The laboratory identification of malaria is not impossible and does not require an experienced parasitologist. It does require persistence and the willingness to try unfamiliar techniques. But above all it requires that the brain be kept in gear with the eyes. Every laboratory in Minnesota has (or should have) an up-to-date copy of Todd and Sanford.[2] The diagnosis can be made from a thin film (as it was in this case) or a thick film. The thin film technique may be tedious, but the cytologic features are familiar. The thick film technique can be quite challenging because the usual cytologic elements are destroyed and the smear has an unfamiliar appearance. It is important to identify the species so that falciparum malaria can be treated at once. The State Board of Health is in a position to confirm the diagnosis when necessary.

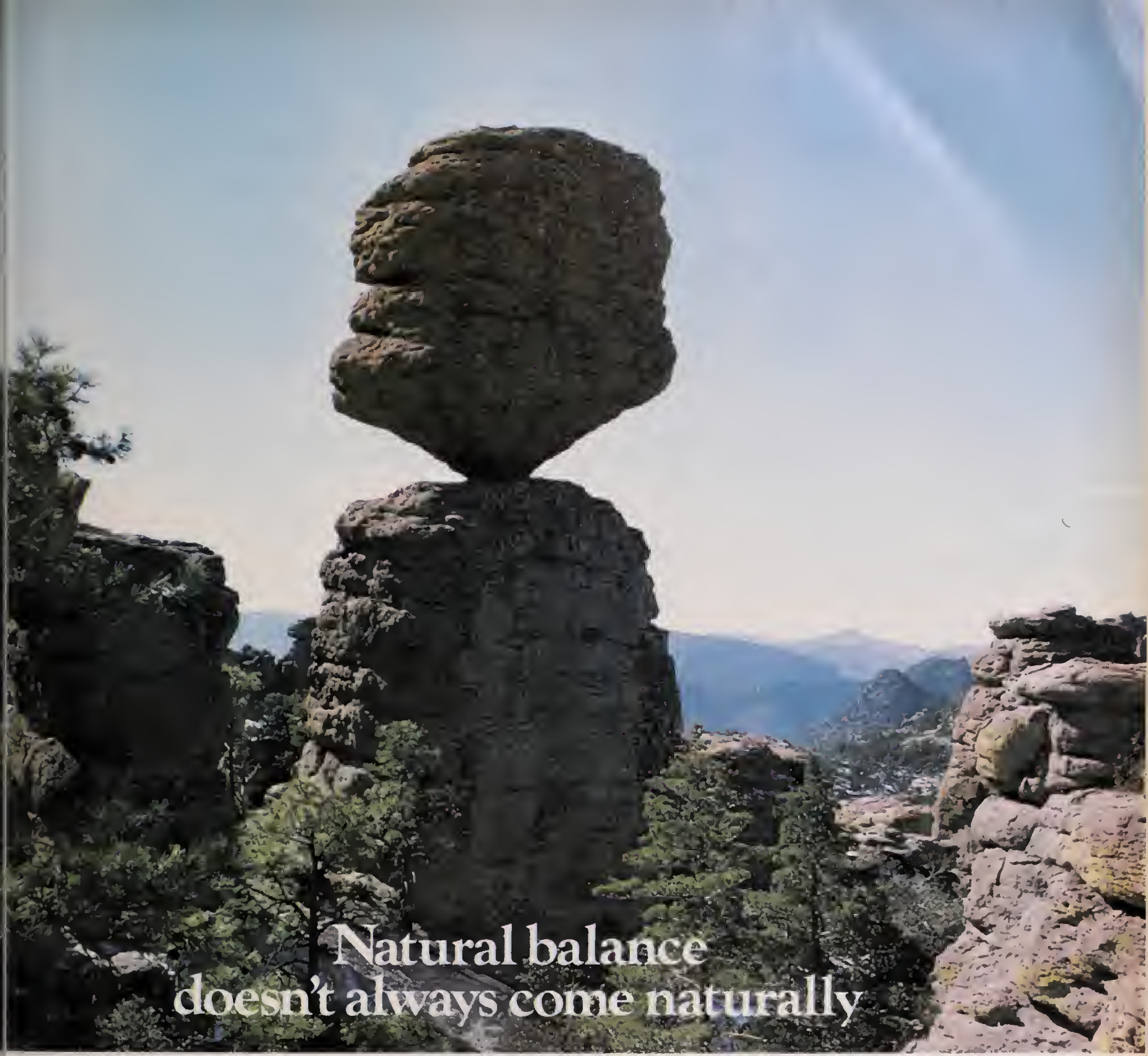
The occurrence of malaria in Minnesota, even in the winter, is obviously not impossible. It can be diagnosed when the clinician is willing to take the time to take an adequate history, and the laboratory worker is willing to spend the extra time at the microscope and think about what he or she is looking at.

---

*Children's Hospital, 311 Pleasant Ave., St. Paul, Minnesota.

References

1. Beck, JW. and Barrett-Connor, E. Medical Parasitology. St. Louis, C. V. Mosby, 1971.
2. Davidsohn, I. and Henry, JB. Clinical Diagnosis by Laboratory Methods. 15 ed. Philadelphia, WB Saunders, 1974.



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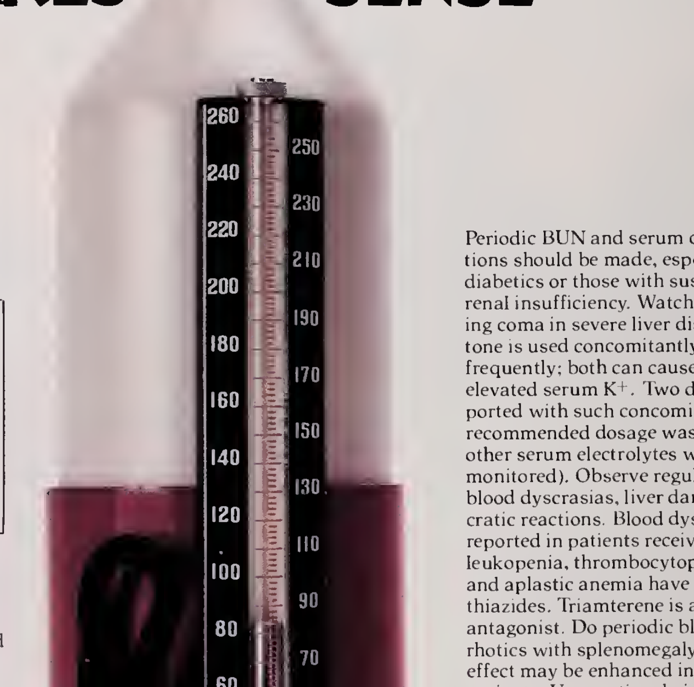

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Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis.

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Interview with Dr. W. Albert Sullivan

Associate Professor of Surgery and Associate Dean of Admissions and Student Affairs
University of Minnesota Medical School

Interviewer:
How long have you participated in the medical admissions process at the University of Minnesota Medical School?

Dr. Albert Sullivan: About 10 years.

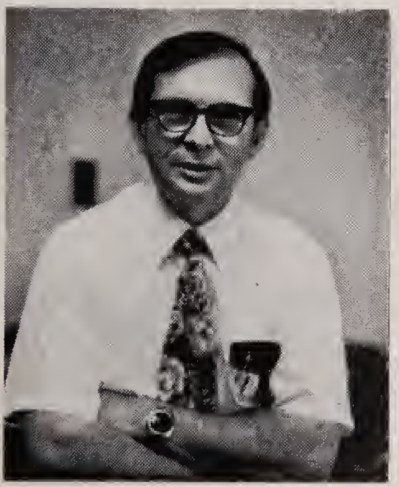
Interviewer: *How many students have you personally interviewed?*

Dr. Sullivan:
A couple of thousand, I would guess. Even before I got into admissions, however, I was involved with medical students. In any event, not many students have gone through this medical school in the last thirty years that I do not know or have not met.

Interviewer: *Thirty years? Did you come as a resident?*

Dr. Sullivan:
I came to Minnesota as an intern in 1947, but I worked here on a surgery research project the summer before that between my junior and senior years of medical school.

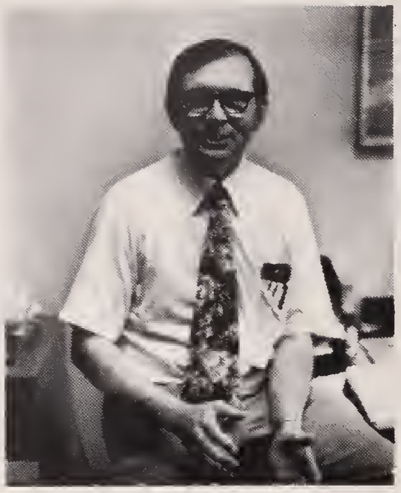
Interviewer:
I see. As you may know, there is widespread interest among physicians and society at large on who gets admitted to medical school. Could you explain how you choose whom you admit?



Dr. Sullivan:
I would be happy to, if for no other reason than to dispel a few myths. In the last ten years, there has been a marked increase in applicants to medical school in Minnesota. For instance, in 1957 we had 258 people who applied to this medical school. Last year, we had 1,758 applicants. This same sort of exponential growth has occurred in every medical school in the United States. We are seeing the effect of the baby boom and fascination with medicine as a career.

Interviewer: *How many of the 1,758 were Minnesotans?*

Dr. Sullivan: About 900.



Interviewer: *That's impressive – and this is a national phenomenon?*

Dr. Sullivan:

Right. The figures are available. In 1971, there were 29,000 people in the United States who applied for approximately 12,000 places. In 1976, there were 42,000 who filed 365,000 applications for 15,613 places. This means that 37 percent of those who applied were accepted.

Interviewer: *So the selection process is more difficult?*

Dr. Sullivan:

Every medical school has more well qualified applicants than it can accept. In Minnesota this year, only 48 of 889 applicants' credentials were so poor that is was obvious that they would not be accepted — that's only 7 percent. So 93 percent had reasonable enough credentials to be considered for medical school.

Interviewer:

I have heard 20 years ago you selected classes knowing perhaps 20 percent would not make it. Now you can be so much more discriminating that only 1 or 2 percent will fall by the wayside.

Dr. Sullivan:

That is true. The selection process now is such that practically no one ever flunks out. Students change their minds — and some are unable to do the work. But from experience we know it is not usually because they are having academic problems — something else is getting in the way of doing their work.

When I was in medical school, we were told 30 percent would flunk before the first semester ended. There wasn't room enough for everyone.

Now when we admit someone, we know that we've got a place for him/her. We plan on their continuing through medical school.

Interviewer:

For the last 12 years, the college entrance exam scores have been dropping. What have the Medical College Admission Test (MCAT) scores been doing?

Dr. Sullivan:

MCAT scores have gone up every year. Brighter and brighter people apply to medical school.

Interviewer:

Could you tell us about the admitting process? For example, who is on the Admissions Committee?

Dr. Sullivan:

The Admissions Committee at the University of Minnesota consists of 13 people: five from the basic science faculty, five from the clinical science faculty, and these ten are elected by the Executive Faculty of the medical school. There are also two members selected by the State Medical Association. It happens this year one is from Ramsey County and one is from Hennepin County. I'd like to congratulate those men for the work that they've done. In addition, there is one student member who is elected by the Medical Student Council.

Except for the student member, a final year student who serves one year, all members serve three years. One third of them are replaced each year, so that there is always continuity.

Interviewer: *How do these 13 committee members go about rating students?*

Dr. Sullivan:

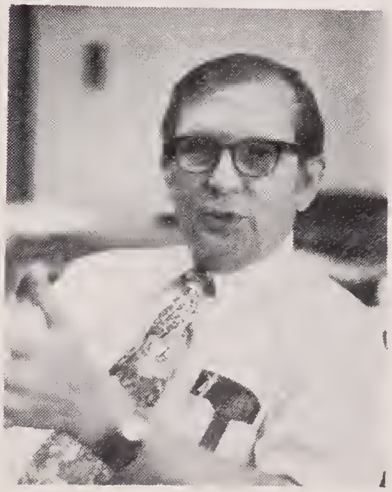
Well, first of all, 88 or most of the medical schools in the country now participate in the American Medical College Application Service (AMCAS) which is run by the Association of American Medical Colleges. This means that an applicant need make only one application and submit only one certified transcript.

The application and transcript go to the office of AMCAS. The student decides which schools to send the material. Students can send out as many as they want. The average number is 7.5 applications per applicant.

When we receive applications from AMCAS, we know that they are official and they have checked out and verified the transcript.

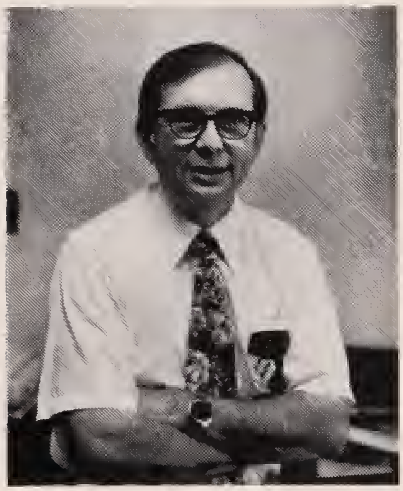
We do an initial screening. As I said, less than 7 percent of the Minnesotans who applied this year had qualifications that were noncompetitive. We divide the others into two groups: (1) those whose acceptance seems quite likely and (2) those whose acceptance hinges on further evaluation. We invite Group 1 to come in for an interview as well as to fill out supplemental information forms, get the Minnesota test battery, and provide letters of evaluation. We carefully point out that these are letters of *evaluation,* **not letters of** *recommendation.* **We think evaluation differs from recommendation.**

One of these letters is from the academic institution they are attending. Generally students ask a premed committee or faculty member to write a letter for them. Another letter comes from their most recent employer. We stress that the letter should be from the person in that organization who knows them best. For example if they worked for an organization with 10,000 employees, the president of the organization would be unlikely to know them well enough to evaluate them.



The third letter comes from their roommate or close friend. We will not consider any application unless we have had an evaluation from a peer. These are the most worthwhile letters, because their peers are really the most honest, down to earth, and tell it "like it really is."

There is also a second group whose qualifications are excellent but not quite as high. They fill out the supplemental information form that I mentioned earlier. We tell them that we will invite them to come in for an interview after the Admissions Committee screens their applications if this seems desirable. No one, and I like to emphasize this strongly, is ever accepted or rejected by a computer, or a secretary or a single individual. Several people thoroughly and thoughtfully evaluate all information before a decision is made.



Interviewer:

I understand if your grade point average is 3.0 or below, you need not apply.

Dr. Sullivan:

That is not true, because we don't look just at the overall grade point average. We look at the slope of the curve of the grades. There are many fine medical students and many fine practicing physicians who did not have an overall 3.0 average. Early in their academic career, they might not have decided what their goals were in life and they might have done miserably even to the point of flunking out of school. When they left to go to work or to go to the armed services, they might have found themselves, then came back to school and scored excellently, so their overall GPA might be only 2.8. But this was due to the 1.0 they had during their first year.

Thus, we don't look just at a grade point average. Rather, we look at the slope of what their grades have been and what course they have done well in. We look at their science courses; how they've done in them compared with their non-science courses. We look at every aspect. There is no single grade or an overall GPA that is going to keep someone from being considered.

On the other hand, we shy away from someone who has consistently had grades averaging between a 2.5 and a 2.8. We feel these students should sit back and look at themselves realistically, since they will probably not be able to meet the competition in which there are almost four applicants for every available place.

Interviewer:

As I understand it, there are five factors involved: (1) grade point average (2) AMCAS scores (3) evaluation letters (4) interviews (5) extracurricular activities. How are these weighed?

Dr. Sullivan:

There are many more than five factors. We consider three or four letters of evaluation. We look into performance; what they've done; what sort of things they've done to make the world a better place; what their extracurricular activities have been.

It's rather easy after you've seen several thousand applications to detect the differences between the students who have had isolated extracurricular activities and those who have done this work consistently for three or four years in college.

We consider students individually. If it were just grades or AMCAS, there are computers that could select a class in only a few seconds.

We feel what we're doing is important. We want someone with academic ability to go through medical school. Even more importantly, we're looking at what these young people are going to be like 10-15-30 years later. We know that many physicians have disabling problems later in life. Physicians have one of the highest suicide rates; one of the highest alcoholism rates, and one of the highest divorce rates, of all professionals. These statistics disturb us. If we can prevent some of these disabilities by preventing them, society and medicine are going to be the better for it.

Interviewer:

I have heard criticism that medical schools select people who are good students but not necessarily good doctors.

Dr. Sullivan:

We want someone who will be a good student, but we also want someone who will be a good physician. Good students don't by definition necessarily make good physicians. And getting all A's in college or medical school does not make a person a good physician, but it does not necessarily exclude them.

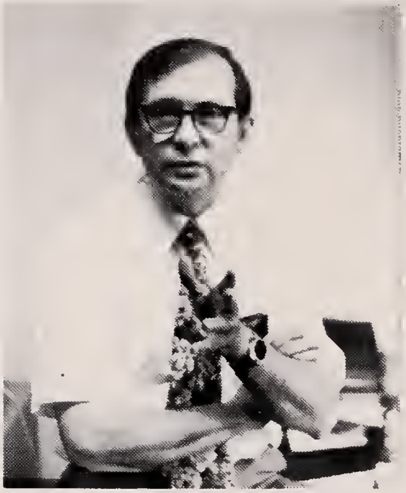
Interviewer:

I hear the admissions committee has a final scoring system, sort of an olympic scoring system of 1.1 to 9.9 to select the final applicants.

Dr. Sullivan:

Yes, we do. But background information will help understand the system.

After an application is complete, and in dealing with several thousand applications and realizing that anywhere from 10-15 bits of information are coming in on each one, that's a lot of material to gather. No one need ever worry that their application won't be considered because something is missing. We always notify the candidate that a certain letter has not come in or they're missing



something in their application. Even though someone may have submitted an application in July and not have heard anything from us in six months, they may think we've forgotten, but we haven't. We explain this in the letter we send out to the applicants, that we will notify them; that no one's going to fall by the wayside because of an error on our part.

Without forgetting the scoring system, I would like to mention something about interviews. There are so many myths about interviews that it scares me. Someone will say that he or she didn't get in because they had a bad interview. We on the Admissions Committee deny that a single interview may ruin a person's chances. Someone may have had an unfavorable interview, but there are other people to interview them. A given interviewer on a specific day might well be in a bad mood or something like that.

Interviewer: *So there are more than two interviews?*

Dr. Sullivan:

Not always. If both interviewers say the candidate looks good, then additional interviews are not necessary. But in case one of the first interviewers is not impressed, there is always a backup so no one is turned down because of a single bad interview.

Once the application is complete, it is sent out to two members of the Admissions Committee each of whom will go over it with a fine tooth comb. They look at every aspect of it including what courses were taken, when they were taken, what other courses were being taken simultaneously, etc. For example, if someone got an "A" in organic chemistry and that was the only course he or she was taking that quarter or semester, that is not nearly as impressive as if they were taking chemistry, physics, biology as well as two tough non-science courses at the same time.

After we look at all factors, the two individual reviewers will present the application to the Admissions Committee. The committee has an opportunity to ask questions about it so every application is gone over by the committee.

After anywhere from 5 to 30 minutes of discussion on a given application, when no one else has any more questions to ask then is when the "olympic diving scoring" method comes in.

On a given signal, everyone holds up his card which gives the applicant a ranking between 1.1 and 9.9. We take the average scores of that and the 239 highest scores are those who are accepted.

For anyone who questions this system, remember it used to be "yes" or "no". That was difficult. Committee members had some people they really felt strongly about, others that they didn't want to say "no", they shouldn't be accepted or "yes" they should. They were caught between the rock and the hard place. The olympic system is a fairer way of evaluating these candidates.

All medical schools send off letters the 15th of each month beginning in December. We send our letters once a month up through March, then on a rotating basis.

There will be some people whose scores are so high that it is obvious that they are going to be admitted and they are told of this in the next mailing. There are others whose olympic scoring is so low they don't have much of a chance of being accepted. We notify this latter group as early as possible so that they can make alternative career plans. There are some applicants' scores we don't know until the end of the year. As soon as we are sure an applicant is accepted, we notify him or her.

Just to keep this from ever being prejudiced, the Admissions Committee members don't know what these average scores are. They vote on each applicant as they see it. And similarly, if any one member of the committee votes so very high or so very low that it is more than a standard deviation from the mean, we exclude that vote. We don't feel that any one person should have the opportunity of accepting or excluding someone.

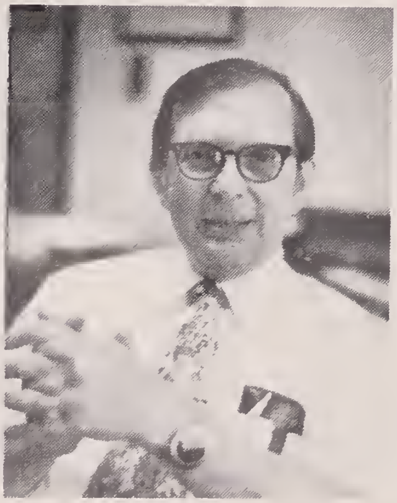
Interviewer:

Maybe you can explode another myth. One of these is if you are a physician's son, if you come from a wealthy suburb or if you have gone to college out of state, those three factors are used against you.

Dr. Sullivan:

I dismiss that as an incorrigible lie. Yes, there are lots of physicians' sons and daughters who are applying to medical school. They have been around medicine all of their lives and this is understandable. In our past freshman class, 10% of them were sons or daughters of physicians. That is high, far greater than any other occupational group, but it is not surprising because more physicians' sons and daughters apply.

We accept a lot of sons and daughters of physicians. Unfortunately, we turn them down a lot too. The bit about being from a wealthy suburb has no bearing whatsoever. We take people from Edina, St. Paul, Minneapolis and from the smallest counties in the State. For instance, from Crow Wing County, we have two students who came in this year and from Hennepin County, we have 106. Roughly, this is proportional to the population. No one loses a residency by going to college out of state. Legally, when one leaves the state for educational purposes or military services, one does not lose his or her legal residence.

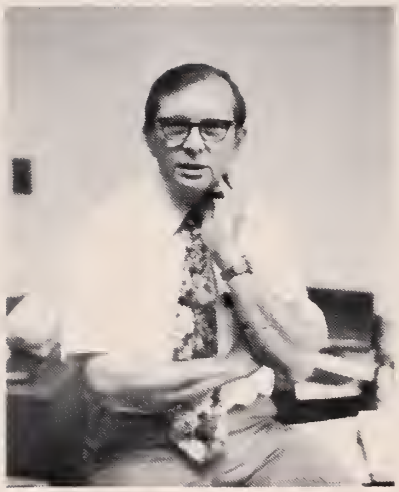


Interviewer:
The second issue frequently discussed is minority students. What are the rules for admitting minority students?

Dr. Sullivan:
Like every other medical school in in the country, we are trying to get minority students into our school. This has been difficult. Early, when we instituted this program, we encountered difficulties in our eagerness to get minority students. Perhaps we took some that should not have come in.

Because of the extraordinary few minority students proportionately in our State, (something like less than ½%), we frequently go outside of Minnesota to find minority applicants.

We are not taking people just because they are from a minority group. We take people only because they have the qualifications and can make it through medical school. Some minority applicants may not have as high a grade point average or look as brilliant as someone who has gone to an Ivy League University or comes from an influential or affluent background. But people we take in through the minority program are able to make it through. We are not going to turn out anyone that can't.



Interviewer: *Do you have a quota of minority students you accept?*

Dr. Sullivan:
No, we have no "quota". We have tried, not always successfully, to get up to 10% of the class from underrepresented groups. We accept a larger group of minority students, but only about ⅓ of those that we accept enroll here. Let's face it, tuition for these non-resident students is presently almost $7,000 a year. So you see, tuition is a big factor in a non-resident coming to Minnesota.

Interviewer: *What does it cost a resident?*

Dr. Sullivan:
For a resident, the present cost is $677 a quarter; for a non-resident, it is $1,734 a quarter and the students go four quarters a year.

Interviewer: *So there is no time off in the year?*

Dr. Sullivan:
Not in the first two years except for brief vacations. So there is no opportunity to work. For this reason, most minority applicants are from out of state, are not only minority applicants but from an economically disadvantaged segment.

Interviewer:

I would like to broaden the discussion. There are three medical schools in the state, located at Rochester, Duluth, and Minneapolis. Do these schools have different missions? Do they try to train different kinds of students?

Dr. Sullivan:

The Duluth School, essentially a branch of this medical school, tries to take students from non-urban areas because statistically these are the people who will go back to rural or non-urban areas. Of course, some people from large metropolitan centers will end up practicing a lifetime in small towns. Similarly someone from a rural place could end up being a Park Avenue plastic surgeon. But statistically most people from small towns will go back. So Duluth has specifically tried to get those. Those admitted to our school and to Mayo Medical School in Rochester, I think, are strikingly similar.

Interviewer: *Could you tell us the number of students in each school and class?*

Dr. Sullivan:

The Duluth School takes in 36, we take in 239, Rochester takes in 41.

Interviewer:

That's 316 a year. Some physicians in this state worry about producing too many physicians. Do you have any comment on that?

Dr. Sullivan:

Within the foreseeable future, I don't think there will be too many physicians. Yes, Edina may fill up sooner than other areas, but our students now and for many years have gone both into family practice, and to non-urban areas. Many places now underserved and underrepresented are going to get doctors. I don't foresee that Minnesota will be oversaturated with doctors, however.

Interviewer:

What percentage of graduates now go into primary care as compared to 10 years ago?

Dr. Sullivan:

Around 65% are now going into primary care. The University of Minnesota Medical School is unique. We have many graduates going into primary care and family practice, but we also turn out many medical educators.

Interviewer:

So many of your graduates become academic leaders as well as rural physicians?

Dr. Sullivan:

We rank eighth in the country in producing academic leaders; second or third in general physicians.

Interviewer:

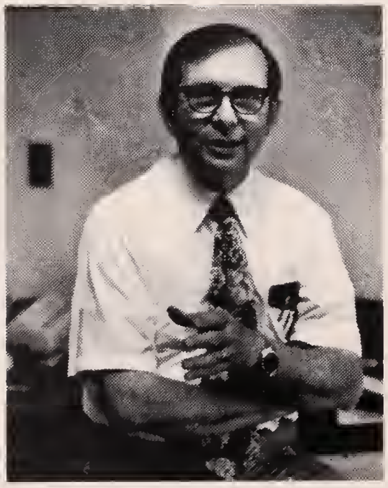
Raymond Pruitt, former dean at the Mayo Medical School, has said there are three charges frequently leveled against academic medicine. One is you have produced too few physicians. Two, you have produced your kind of physicians rather than the kind needed by society, and three, you have made no effective effort to assure geographic distributions in the best interest of society. Could you comment on these charges?

Dr. Sullivan:

I think there is a certain degree of truth in these charges: (1) We did produce too few physicians. But throughout the country, we have increased our graduates. In our medical school, we have doubled. We had 120 positions, now we have 240, the biggest increase among Medical Schools in the United States. (2) Second, we have produced the kind of physicians we have wanted to produce. As a transplant to Minnesota, I hope I can speak with a high degree of chauvinism. This school reflects this State's character. We are turning out many primary physicians because that's what our population wants.

Now with regards to geographic distribution, I am not sure the medical schools have had as much influence as we have been accused of. Many factors determine whether a physician will settle in a smaller community. These include educational, mercantile, intellectual and recreational opportunities for the physicians and their families. I don't think we in medical education can be held responsible for these factors.

Yes, the town of 185 that is 100 miles away from any other town does need medical care. But one can't compel physicians to practice in small towns. Many other factors go into that decision. As we produce more physicians, we may find more who will practice in the non-urban areas. In Minnesota, we are fortunate. With the exception of upper Red Lake and Lake Counties Minnesota, no one is more than 30 minutes from a physician. In the old days, when people had to go by horse and buggy, 25 miles might make a real difference. Now people will go 25 miles or 30 minutes to go to a movie or go shopping. No one in our State, at least, is being deprived of medical care. The maldistribution problem is not quite as bad as people would like to say it is.



Interviewer:

I agree with you Minnesota has reason to be proud. It has been rated number one in health care in several national surveys. I am sure the University of Minnesota has had a lot to do with that. Let's go back to medical admissions. What about students who fail on their first try at admission but are still well-qualified?

Dr. Sullivan:

Many that we reject the first time are well qualified. The average grade point average of applicants we had from Minnesota this year was 3.35. We turn down good people, but we encourage people to reapply. In the present freshman class, something like 30% of the class are reapplicants having reapplied from once to four times. This year, we have instituted a policy that if someone has been turned down twice in a row, they may not reapply for at least one year. During that year, they can improve their credentials, either by taking more courses or by doing additional work outside. Also for all medical school applicants in the United States, effective in 1978, students must take the New MCAT and a better MCAT score may also improve their chances.

Interviewer:

Is there an upper age limit for applicants? I am reminded here of the Bakke Court Case in California. A 32-year-old NASA engineer was allegedly turned down at the University of California in Davis because of his age, partly because he was white. The Supreme Court will soon consider his case. The main issue, I understand, is "reverse discrimination".

Dr. Sullivan:

The Bakke Case was not predicated on age. As we have outlined it in our listing in the book entitled "Medical School Admission Requirements", published by the Association of AMA Medical Colleges: "although there are no age limits, very young and relatively old applicants must demonstrate considerable strength in other aspects of their application". This is not being discriminatory against older students. It is being practical. One, we have good evidence that older applicants do not do as well. Medical school is hard for them, it is difficult, it is time consuming. When one gets into an older age group, one doesn't have the basic resilience, energy, and enthusiasm of younger students.

Moreover, we have an obligation to provide as many physicians for as long a period of time as possible. If we take in a candidate who is 15 years older than average, on the other end of the spectrum the doctor will practice 15 years less. Admittedly, a 25 year old healthy young man might go and break his neck walking out of the graduation ceremony and someone else practice until the age of 85, but statistically the older applicant is not going to be able to practice as long.

Interviewer:

What about the young applicant? I understand that you only take four-year graduates. Would you consider 3 years of premedical work?

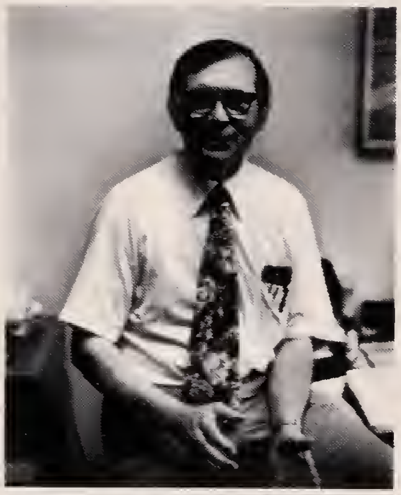
Dr. Sullivan:

We strongly discourage people from rushing through. Life is long. Those who rush through without any pause may have a high degree of academic maturity, but emotionally they probably did not have a chance to interact with their fellow students and fellow human beings. We encourage them to take their time.

As a matter of fact, this year we selected a number of students whom we told to wait for a year. Some even waited two years. A year or so delay often helps them to mature emotionally.

Interviewer:

What about the student who is rejected in Minnesota, yet is well qualified? What are his chances of getting into a private medical school?



Dr. Sullivan:

Minnesotans are lucky in that respect. On the basis of population, we have the highest ratio of places available of any State in the country with the exception of North Dakota. This year, 940 Minnesotans applied to some medical school or another. A higher percentage of them get in than from any other State in the country. We have good people from Minnesota.

Presently, it is useless for Minnesotans to apply to another state supported medical school. They are just not going to get in. But there are many private medical schools that strive for a geographic diversity. So we encourage people to spread their applications around.

One of the things that you haven't mentioned and because I feel so strongly about it, I think we should talk about it. That is, the different composition of our classes now. We have many women in medical school and we think that this is highly appropriate. About 20 or 25% of our classes are women. Contrary to past myths, these women are doing just as well, functioning just as long, and doing as much work as their male counterparts. We think they are great additions to the profession. We don't take people because they are male or female, but we rather consider them as persons.

Interviewer:

Do you think that women bring any changes in the medical school environment? Maybe soften the competitive atmosphere?

Dr. Sullivan:

No, the women can compete on their own. They don't take a back seat to the men. They are working effectively and well—even in specialties that once were thought of as being limited to males.

Interviewer: *Is their specialty distribution similar to males or is there any difference?*

Dr. Sullivan:

Well, there are still hangups on the part of some specialties about taking women. But this is changing and we have women doing just as well as males in surgical specialties and non-surgical specialties.

Interviewer: *Can a non-resident get into the University of Minnesota?*

Dr. Sullivan:

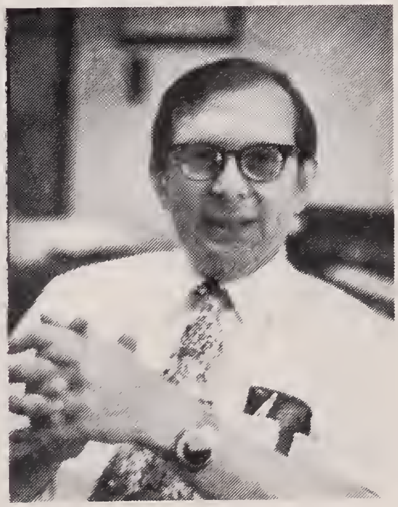
Effective this year, we will again take a limited number of non-residents, but only those non-residents who are willing to make this commitment: if we accept them, they are obligated to come here. They may not make application to any other medical school in the country and even if offered a place, they cannot take it. In the past, what happened was that if we had an extraordinarily fine non-resident whom we would like to take here, they were also accepted in 5 or 6 other medical schools and as a result, only about ¼ of the non-residents we accepted ever came here. Now we are going to make them commit themselves. If they are willing to commit themselves to coming here, then we will consider them. This is what is known as the early decision program.

Interviewer:

Dr. Sullivan, can you list some of the colleges from which students are accepted and the number of students in this years admitting class?

Dr. Sullivan:

There are more than 60 different colleges represented in the 239 students. We are lucky in Minnesota. We have a large number of small colleges, as well as the University of Minnesota and State Universities and we take students from all of them. We are not evaluating the college, the university, or the State University, rather we are evaluating the individual applicant. We hope to avoid the charge of parochialism and insularity, and we take Minnesotans from colleges from the east coast, west coast, south, and southwest. We take Minnesota students from all over the country. We're proud to have Minnesotans return to their native State.



Interviewer: Dr Richard L. Reece
Photographer: Dr. Farrell Stiegler

Preventive Medicine

Premature Cardiovascular Disease

Pediatrics and Prevention

JAMES H. ZAVORAL, M.D.*

Risk factors for premature cardiovascular disease can be detected in children. Once atherosclerosis is clinically evident, it is often too late. Prevention and detection in children at increased risk must begin at an early age.

Atherosclerosis and its manifest disease, myocardial infarction, are not problems solely for physicians treating adults. When atherosclerosis is clinically evident it is often too late. Prevention and detection in individuals at an increased risk for early heart disease must begin at an early age.

Atherosclerosis is a generic term which indicates a disease of blood vessels which impairs their ability to nourish tissues. Specifically, atherosclerosis as discussed here is a disease of large arterial vessels and most importantly a disease of the coronary arteries.

Atherosclerosis is a disease of the living—it is not just a postmortem diagnosis. Atherosclerosis or its predisposing factors can and must be detected early so that preventive measures can be instituted.[1,2,3,4]

The average apparently healthy man has about one chance in five of experiencing a myocardial infarction before the age of 60, and one in fifteen of dying from a heart attack. The key to prevention is multifocal and involves control of: blood pressure, blood lipids, smoking, exercise, obesity and diet at an early age.[5]

Clinicians involved with atherosclerotic problems realize that there are knowns and unknowns about the etiology of atherosclerotic heart disease. One can look at premature cardiovascular disease as a problem with known associated risk factors i.e., hypertension, smoking, hyperlipidemia, etc. and known but less manageable risk factors i.e. diabetes, family history of premature myocardial infarction, type "A" personality and unfortunately a third group where cardiovascular disease is present without any of the known associated or etiologically related risk factors (Table 1).

TABLE 1
Risk Factors for Atherosclerotic Heart Disease

- **I. Manageable Risk Factors**
  - **A. Hypertension**
  - **B. Hyperlipidemia**
  - **C. Smoking**
  - **D. Diets High in Saturated Fats and Cholesterol**
  - **E. Sedentary Life Style**
- **II. Less Manageable Risk Factors**
  - **A. Family History or Genetics**
  - **B. Diabetes**
  - **C. Tension, Type "A" Personality**
- **III. Unknown**

These categories take some liberty and do not imply that all the factors in Category Two are necessarily unmangeable. Category Three demands attention.

The lipid hypothesis, that serum lipids are directly responsible for atherosclerotic heart disease remains unproven. There are many complex interactions involving lipids as well as other independent risk factors, some of which have not yet been identified, which initiate and accelerate atherogenesis.[6]

This complexity, however, does not destroy the operating hypothesis of the role of lipids in the familial hyperlipoproteinemic diseases.[7]

Certain risk factors contribute to or are associated with the development of coronary heart disease. They are additive and almost certainly causal. These factors have been defined and should be modified in susceptable subjects.

What Is Possible?

Regression of atherosclerosis in animals has been well documented. Dietary manipulation in rhesus and cebus monkeys, swine, dogs and in pigeons has demonstrated regression of atherosclerosis.[8]

Armstrong reports that the lipid content of his experimental plaques was similar to that in human atherosclerosis.[9]

Since the turn over time for cholesterol in human atherosclerosis is 442-934 days, regression if it occurs in the human is likely to be slow.[10] There is evidence that in the animal, cholesterol can be mobilized and atherosclerosis lesions reduced. Dietary risk factor management in man may lead to the regression of established atherosclerosls or at least halt the accelerated progression of atherosclerosis in certain individuals with familial hypercholesterolemia.

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Medical management of heart disease is usually started too late and is often ineffective in the prevention of heart disease. In the Framingham study 60% of the deaths from myocardial infarctions occurred outside the hospital and 50% of the deaths occurred within one hour of the onset of symptoms. Sadly, one third of the deaths occurred in victims without previous knowledge of heart disease.[11] No matter how sophisticated the coronary care unit, emergency transport, medical, pharmacological or surgical management we have, it is often too late or temporizing in nature.

All physicians, especially those caring for children, must make a concerted effort to prevent heart disease. The most direct approach to this problem involves the careful monitoring of blood pressure at all ages. Awareness of a family history of premature cardiovascular disease, i.e., cardiovascular events under age 55, should prompt primary physicians to search for the known risk factors associated with accelerated, premature cardiovascular disease.

Early Detection

Hyperlipidemia is strongly associated with premature heart disease and it can be detected at an early age.[12]

How Common is Familial Hyperlipidemia?

The familial hyperlipidemias are detectable at early ages—usually by age two in familial hypercholesterolemia, by the second decade in some forms of mixed hyperlipidemia and in the third decade for most familial hypertriglyceridemias.

Among the more common genetically inherited diseases—Familial Hypercholesterolemia is the most common (Table 2).

TABLE 2
Incidence of Common Genetically Inherited Diseases

Familial Hypercholesterolemia	**1:300**
Trisomy 21	**1:600-1:1000**
Sickle Cell Anemia	**1:625**
Cystic Fibrosis	**1:1500-1:2500**
Phenylketonuria	**1:14,000**
Duchenne Muscular Dystrophy	**1:10,000**

McKusick, 1975[13]

Although familial hypercholesterolemia is not as lethal or severe as some of the diseases listed in the Table it certainly becomes more lethal in the fourth, fifth and sixth decades. The frequency of the gene is 0.1-0.5% of the population. Familial hypercholesterolemia is found in 5% of the survivors of myocardial infarcts under the age of 55. In large families followed in Minnesota and in the literature, 50% of individuals with familial hypercholesterolemia will have clinical coronary heart disease by the age of 50.[14,15]

Several cord blood detection programs have published their results.[15,16] With current technology a significant number of false positive infants are identified. Until more sophisticated lipoprotein measurements are correlated with age and diet, the cord blood detection of familial hyperlipidemia should remain an investigational means to screen children.

Atherosclerosis, because it is a disease of the living, probably begins in the early years of life. It is a theoretical advantage to begin preventive efforts early. Dietary management in familial hypercholesterolemia beginning in early childhood should be more effective than dietary management starting in the 40's, 50's or 60's. Large dietary trials have highlighted the decreasing effectiveness of dietary management of hyperlipidemia with age. It seems apparent that we must direct our efforts at an earlier age. Pharmacological management with the various lipid lowering drugs is controversial and often disappointing. Also these agents have physiological, psychological and economic disadvantages.[17]

The surgical management of atherosclerosis is reserved almost entirely for symptomatic individuals i.e. coronary artery bypass or revascularization surgery. No one looks to this type of surgery as preventive but as an attempt to salvage dying tissue. Two to 8% of patients undergoing coronary revascularization surgery don't survive the operation, 20-30% suffer a myocardial infarction as part of the operation and only about 70-80% of the bypass grafts are open at one year following surgery. This does not mean that surgery of this type is bad, only that prevention of atherosclerosis is a more appealing approach.[18]

Familial hyperlipidemia must be suspected and identified where there is a positive family history for premature cardiovascular disease.

As mentioned in Table 2 many resources are utilized in detecting other genetic diseases which are much less common than familial hyperlipidemia. More efforts and resources should be directed at detection of the familial hyperlipidemia in the pediatric population in order to prevent heart disease.

Family–Dietary Approach

Because familial hypercholesterolemia affects one half of the children and one parent, we direct our primary approach to dietary management of familial hypercholesterolemia at the whole family. This approach makes meal preparation simple, involves the entire family and increases adherence and understanding of the diet. The diet is approached in a manner so that the children and parents are accepting and educated. Meal planning centers about the home, school and meals eaten out. Emphasis is placed on sound nutrition and foods to enjoy. Less emphasis is placed on foods to avoid. The children are encouraged to feel good and normal about their diet and not different because of what they can't eat.

As in any setting, often enthusiasm runs high initially with a fall off in dietary adherence with time. To counteract this we provide longitudinal follow up with new recipes, cardiovascular education and encouragement.

Pediatric Lipid Preventive Atherosclerosis Clinic

At the Hennepin County Medical Center we are following families with familial hyperlipidemia, some of whom are at a severe risk for premature cardiovascular disease. Many of the parents have experienced a heart attack or died in their 20's, 30's and 40's. In some families with familial hyperlipidemia no hyperlipemic individual has survived past age 40.

The children from these families face similar odds of survival. Family studies demonstrate that 75% of individuals who have had a myocardial infarction under age 50 have a lipid disorder and that one third of the children from these families will have abnormal lipids.[19] The Pediatric Lipid Preventive Atherosclerosis clinic is following many families with familial hyperlipidemia. The majority of these families have familial hypercholesterolemia. Because of psychological, financial and undesirable side effects it is difficult to treat children with lipid lowering medications.

The Pediatric Atherosclerosis clinic is unique in that although its focus is on children we evaluate the entire family. This works well because the family essentially shares the same dietary habits and the same genetics.

The adults and children from these families are screened for all the known risk factors for atherosclerotic heart disease. Screening, diagnosis, and counseling are given on a longitudinal basis for lipid abnormalities, hypertension, smoking, exercise, life style and dietary education for sound nutrition, avoidance of obesity and the lowering of cholesterol.

Encouragement, support and ongoing information are given at each visit by a physician and a nutritionist. No one is satisfied with our present knowledge of and ability to prevent heart disease; therefore, many variables are being evaluated from a therapeutic, practical and research standpoint. These assessments include; stress electrocardiograms, thrombosis and platelet function studies, phospholipid analysis, coagulation studies, metabolic balance studies of cholesterol catabolism and of greatest focus—response of blood lipids to a variety of dietary manipulations.

Summary

Atherosclerosis is a disease of the living and begins at an early age. Prevention must begin early because once atherosclerotic disease is clinically evident it is often too late. A multi risk factor approach to the prevention of premature cardiovascular disease must be aggressively sought. Because benefits from pharmacological and surgical therapy in adults are often disappointing, an early nutritional approach in children offers hope for the prevention of heart disease.

The familial hyperlipidemias are common genetically inherited diseases. Children and their parents should be screened to detect potentially treatable hyperlipidemia. A long term dietary approach to familial hypercholesterolemia begun in childhood offers a promise of altering the unchecked course of premature atherosclerosis.

References

1. Symposium on Prevention of Atherosclerosis at the Pediatric Level. Am J Card 31:539, 1973.
2. Nora, JJ. Nora, AH; The Pediatric Roots of Coronary Heart Disease. Chest 68:714, 1975.
3. Mitchell. S, Blout, SG, Jesse, MJ. et. al.: The Pediatrician and Atherosclerosis. Pediatrics 49:165, 1972.
4. Kannel, WB, Dawber, TR; Atherosclerosis as a Pediatric Problem. J of Ped 80:544, 554, 1972.
5. Kannel, WB, McGee, D, Gordon, T; A General Cardiovascular Risk Profile. The Framingham Study. Am J Card 38, 46, 1976.
6. Wissler, RW, Vesselinovitch, D, Getz, GS; Abnormalities of the Arterial Wall and its Metabolism in Atherogenesis. Prog Card Dis XVIII, 5, 341-369, March/April 1976.
7. Goldstein, JL, Brown, MS; Hyperlipidemia in Coronary Heart Disease, a Biochemical Genetic Approach. J Lab Clin Med, 15-25, 1975.
8. Editorial, Lancet, P, 614, 1976.
9. Armstrong, ML, Wamer, ED, Connor, WF; Regression of Coronary Atherosclerosis in Rhesus Monkeys. Clin Res 27:59, 1970.
10. Jagannathan, SN, Connor, WE, Baker, WH: Bhattacharya, The Turnover of Cholesterol in Human Atherosclerotic Arteries. Am J Clin Invest, 54, 366, 1974
11. Gordon, T, Kannel, WB: Premature Mortality from Coronary Heart Disease: The Framingham Study. JAMA 215:1617, 1971.
12. Tsang, R, Fallat R, Glueck, CJ: Cholesterol at Birth and Age One. Comparison of Normal and Hypercholesterolemic Neonates. Pediatrics, 53:458, 1974.
13. McKusick, VA: Mendelian Inheritance in Man. 4th Edition Johns Hopkin, 1975.
14 Zavoral, JH, King, R, Hunninghake, D: Familial type II Hyperbetalipoproteinemia in a Large Kindred. Am. J. Cardiol Abstract. Feb. 1974. Presented Amer. College of Card. Feb. 1974
15. Glueck, CJ, Heckman, F, Schoenfield, M, et al.: Neonatal Familial Type II Hyperlipoproteinemia: Cord Blood Cholesterol in 1800 Births. Metab 20:597, 1971.
16. Dormady, JM, Fasbrooke, AS, Lloyd, JK: Prospective Study of Serum Cholesterol Levels During the First Year of Life. Brit Med J, 2:685, 1972.
17. Hypolipidemia Agents Edited by David Kritchevsky. Handbook of Exp. Pharm. 41, Springer-Verlag Berlin, Heidelberg, New York, 1975.
18. Mundth, ED, Austen, WD: Surgical Measures for Coronary Heart Disease New Engl J Med 293, 13, 75-80, 124-130, 1975.
19 Glueck, CJ, Fallot, RW, Tsang R et. al.: Hyperlipidemia in Progeny of Parents with Myocardial Infarction before Age 50. Am J Dis Child 127:70, 1974.

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Hypothyroid Cardiac	1.0 mg.	1.0 mg.	4.0 mg.	4.0 mg.

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Description

CHOLOXIN (sodium dextrothyroxine) is the sodium salt of the dextrorotatory isomer of thyroxine. It is chemically described as D-3,5,3′,5′-tetraiodothyronine sodium salt.

Actions

The predominant effect of CHOLOXIN (sodium dextrothyroxine) is the reduction of serum cholesterol levels in hyperlipidemic patients. Beta lipoprotein and triglyceride fractions may also be reduced from previously elevated levels.

Most of the available evidence indicates that CHOLOXIN (sodium dextrothyroxine) stimulates the liver to increase catabolism and excretion of cholesterol and its degradation products via the biliary route into the feces. Cholesterol synthesis is not inhibited and abnormal metabolic end-products do not accumulate in the blood.

Indications

This is not an innocuous drug. Strict attention should be paid to the indications and contraindications.

CHOLOXIN (sodium dextrothyroxine) is an antilipidemic agent used as an adjunct to diet and other measures for the reduction of elevated serum cholesterol (low density lipoproteins) in euthyroid patients with no known evidence of organic heart disease.

The drug is also indicated in the treatment of hypothyroidism in patients with cardiac disease who cannot tolerate other types of thyroid medication.

Before prescribing, note the following: Results from a randomized clinical study have indicated a possible adverse effect when CHOLOXIN (sodium dextrothyroxine) is administered to a patient receiving a digitalis preparation. There may be an additive effect. This additive effect may possibly stimulate the myocardium excessively, in patients with significant myocardial impairment. CHOLOXIN (sodium dextrothyroxine) dosage should not exceed 4 mg per day when the patient is receiving a digitalis preparation concomitantly. Careful monitoring of the total effect of both drugs is important.

It has not been established whether the drug-induced lowering of serum cholesterol or lipid levels has a detrimental, beneficial, or no effect on the morbidity or mortality due to atherosclerosis or coronary heart disease. Several years will be required before current investigations will yield an answer to this question.

Contraindications

The administration of CHOLOXIN (sodium dextrothyroxine) to euthyroid patients with one or more of the following conditions is contraindicated:

1. Known organic heart disease, including angina pectoris; history of myocardial infarction; cardiac arrhythmia or tachycardia, either active or in patients with demonstrated propensity for arrhythmias; rheumatic heart disease; history of congestive heart failure; and decompensated or borderline compensated cardiac status.
2. Hypertensive states (other than mild, labile systolic hypertension).
3. Advanced liver or kidney disease.
4. Pregnancy.
5. Nursing mothers.
6. History of iodism.

Warnings

CHOLOXIN (sodium dextrothyroxine) may potentiate the effects of anticoagulants on prothrombin time. Reductions of anticoagulant dosage by as much as 30% have been required in some patients. Consequently, the dosage of anticoagulants should be reduced by one-third upon initiation of CHOLOXIN therapy and the dosage subsequently readjusted on the basis of prothrombin time. The prothrombin time of patients receiving anticoagulant therapy concomitantly with CHOLOXIN therapy should be observed as frequently as necessary, but at least weekly, during the first few weeks of treatment.

In the surgical patient, it is wise to consider withdrawal of the drug two weeks prior to surgery if the use of anticoagulants during surgery is contemplated.

When CHOLOXIN (sodium dextrothyroxine) is used as thyroid replacement therapy in hypothyroid patients with concomitant coronary artery disease (especially those with a history of angina pectoris or myocardial infarction) or other cardiac disease, treatment should be initiated with care. Special consideration of the dosage schedule of CHOLOXIN (sodium dextrothyroxine) is required. This drug may increase the oxygen requirements of the myocardium, especially at high dosage levels. Treated subjects with coronary artery disease must be seen at frequent intervals. If aggravation of angina or increased myocardial ischemia, cardiac failure, or clinically significant arrhythmia develops during the treatment of hypothyroid patients, the dosage should be reduced or the drug discontinued.

Special consideration must be given to the dosage of other thyroid medications used concomitantly with CHOLOXIN (sodium dextrothyroxine). As with all thyroactive drugs, hypothyroid patients are more sensitive to a given dose of CHOLOXIN (sodium dextrothyroxine) than euthyroid patients.

Epinephrine injection in patients with coronary artery disease may precipitate an episode of coronary insufficiency. This condition may be enhanced in patients receiving thyroid analogues. These phenomena should be kept in mind when catecholamine injections are required in sodium dextrothyroxine-treated patients with coronary artery disease.

Since the possibility of precipitating cardiac arrhythmias during surgery may be greater in patients treated with thyroid hormones, it may be wise to discontinue CHOLOXIN (sodium dextrothyroxine) in euthyroid patients at least two weeks prior to an elective operation. During emergency surgery in euthyroid patients, and in surgery in hypothyroid patients in whom it may not be advisable or possible to withdraw therapy, the patients should be carefully observed.

There are reports that sodium dextrothyroxine in diabetic patients is capable of increasing blood sugar levels with a resultant increase in requirements of insulin or oral hypoglycemic agents. Special attention should be paid to parameters necessary for good control of the diabetic state in dextrothyroxine-treated subjects and to dosage requirements of insulin or other antidiabetic drugs. If sodium dextrothyroxine is later withdrawn from patients who had required an increase of insulin (or oral hypoglycemic agents) dosage during its administration, the dosage of antidiabetic drugs should be reduced and adjusted to maintain good control of the diabetic state.

When either or both impaired liver or kidney function are present, the advantages of CHOLOXIN (sodium dextrothyroxine) therapy must be weighed against the possibility of deleterious results.

Usage in Women of Childbearing Age

Women of childbearing age with familial hypercholesterolemia or hyperlipemia should not be deprived of the use of this drug; it can be given to those patients exercising strict birth control procedures. Since pregnancy may occur despite the use of birth control procedures, administration of CHOLOXIN (sodium dextrothyroxine) to women of this age group should be undertaken only after weighing the possible risk to the fetus against the possible benefits to the mother. Teratogenic studies in two animal species have resulted in no abnormalities in the offspring.

Precautions

It is expected that patients on dextrothyroxine therapy will show greatly increased serum protein-bound-iodine levels. These increased serum PBI values are evidence of absorption and transport of the drug, and should NOT be interpreted as evidence of hypermetabolism; similarly, they may not be used for titrating the effective dose of CHOLOXIN (sodium dextrothyroxine). PBI values in the range of 10 to 25 mcg% in treated patients are common.

If signs or symptoms of iodism develop during CHOLOXIN (sodium dextrothyroxine) therapy, the drug should be discontinued.

A few children with familial hypercholesterolemia have been treated with CHOLOXIN for periods of one year or longer with no adverse effects on growth. However, it is recommended that the drug be continued in patients in this age group only if a significant serum cholesterol-lowering effect is observed.

Adverse Reactions

The side effects attributed to dextrothyroxine therapy are, for the most part, due to increased metabolism, and may be minimized by following the recommended dosage schedule. Adverse effects are least commonly seen in euthyroid patients with no signs or symptoms of organic heart disease; the incidence of adverse effects is increased in hypothyroid patients, and is highest in those patients with organic heart disease superimposed on the hypothyroid state.

In the absence of known organic heart disease, some cardiac changes may be precipitated during sodium dextrothyroxine therapy. In addition to angina pectoris, arrhythmia consisting of extrasystoles, ectopic beats, or supraventricular tachycardia, ECG evidence of ischemic myocardial changes and increase in heart size have been observed. Myocardial infarctions, both fatal and non-fatal, have occurred, but these are not unexpected in untreated patients in the age groups studied. It is not known whether any of these infarcts were drug related.

Changes in clinical status that may be related to the metabolic action of the drug include the development of insomnia, nervousness, palpitations, tremors, loss of weight, lid lag, sweating, flushing, hyperthermia, hair loss, diuresis, and menstrual irregularities. Gastrointestinal complaints during therapy have included dyspepsia, nausea and vomiting, constipation, diarrhea, and decrease in appetite.

Other side effects reported to be associated with CHOLOXIN (sodium dextrothyroxine) therapy include the development of headache, changes in libido (increase or decrease), hoarseness, tinnitus, dizziness, peripheral edema, malaise, tiredness, visual disturbances, psychic changes, paresthesia, muscle pain, and various bizarre subjective complaints. Skin rashes, including a few which appeared to be due to iodism, and itching have been attributed to dextrothyroxine by some investigators. Gallstones have been discovered in occasional dextrothyroxine-treated patients and cholestatic jaundice has occurred in one patient, although its relationship to CHOLOXIN therapy was not established.

In several instances, the previously existing conditions of the patient appeared to continue or progress during the administration of CHOLOXIN (sodium dextrothyroxine); a worsening of peripheral vascular disease, sensorium, exophthalmos, and retinopathy have been reported.

CHOLOXIN (sodium dextrothyroxine) potentiates the effects of anticoagulants, such as warfarin or Dicumarol, on prothrombin time, thus indicating a decrease in the dosage requirements of the anticoagulants. On the other hand, dosage requirements of antidiabetic drugs have been reported to be increased during dextrothyroxine therapy (see WARNINGS section).

Dosage and Administration

For **adult** euthyroid hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is 4 to 8 mg per day. The initial daily dose should be 1 to 2 mg to be increased in 1 to 2 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, if that dosage level is indicated to effect the desired lowering of serum cholesterol.

When used as partial or complete substitution therapy for levothyroxine in hypothyroid patients with cardiac disease who cannot tolerate other types of thyroid medication, the initial daily dose should be 1 mg to be increased in 1 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, preferably the lower dosage. The maximum in patients receiving digitalis therapy is 4 mg.

For **pediatric** hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is approximately 0.1 mg (100 mcg) per kilogram. The initial daily dosage should be approximately 0.05 mg (50 mcg) per kilogram to be increased in up to 0.05 mg (50 mcg) per kilogram increments at monthly intervals. The recommended maximal dose is 4 mg daily, if that dosage is indicated to effect the desired lowering of serum cholesterol.

If new signs or symptoms of cardiac disease develop during the treatment period, the drug should be withdrawn.

How Supplied

CHOLOXIN (sodium dextrothyroxine) is supplied in prescription packages of scored 1, 2, 4, and 6 mg tablets.

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Editorials

Premature Cardiovascular Disease

PEDIATRICIANS HAVE always been in the forefront in the prevention of disease. Their practices are organized around immunizations and many other preventive measures, physical, social and psychological.

Dr. James Zavoral in his article: Premature Cardiovascular Disease — Pediatrics and Prevention* has raised another challenge. "Atherosclerosis is a disease of the living and must be detected early so that preventive measures may be instituted."

Obesity can be prevented in infancy, blood pressures may be taken routinely, smoking may be discouraged. The question of blood lipids is more complex. Cord blood screening is not available as yet. Many pediatricians measure serum lipids in the child with a family history of premature cardiovascular disease.

Several questions remain to be answered. What age should the child be screened? What studies should be done? Should all infants be screened? Should the studies be repeated in later years? The most difficult question is how can the diet be implemented, especially if the specter of premature death is only theoretical and not personal within the family.

Dr. Zavoral and the Pediatric Lipid Prevention Atherosclerosis Clinic at the University of Minnesota Hospitals must give us the answers. Pediatricians continue to be interested in the prevention of any morbidity or mortality.

C. Sherman Hoyt, M.D.
Minneapolis, Minnesota

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*See page 744

High Blood Pressure in the Pediatric Patient

THE ARTICLE BY Love and Moller[1] highlights the subject of pediatric hypertension in a comprehensive, concise and orderly fashion. This information will be helpful in implementing the detection, evaluation and management of the pediatric patient with an elevated blood pressure.

The magnitude of the pediatric hypertension problem in a specific area can be roughly ascertained if the pediatric population and the incidence of high blood pressure readings in the children of the area are known. Interpolating from the 1975 estimated figures and the 1980 projected figures of the State Demographer's Office[2], there are currently 1,389,709 residents of Minnesota in the birth to 20-years-of-age category. Assuming a 2% incidence of pediatric hypertension for the state, one can expect to find

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27,794 cases of high blood pressure among the children of Minnesota today. It is therefore important that primary physicians for children and their staffs prepare themselves to meet this diagnostic and management challenge.

An increasing interest in blood pressure patterns of the pediatric age group stems in part from the known relationship of systemic hypertension and its serious complications in adults and in part from the lack of adequate data on the natural history of pure systolic hypertension in children. Furthermore, the cause of hypertension in the younger child is often identifiable and correctable.

The Task Force on Blood Pressure Control in Children appointed by the National Heart, Lung and Blood Institute recently published its initial report[3]. This publication discussed the methodology and instrumentation for blood pressure measurement in infants and children, standards for children's blood pressure and guidelines for the detection of elevated blood pressure. A rational and systematic protocol for the evaluation of children and infants with elevated blood pressure is included. The Task Force report also presents excellent reviews of the treatment and the mechanisms and causes of hypertension. The June 1977 issue of Pediatric Annals[4] was devoted to a broad and in-depth consideration of hypertension in children.

The ground work for the study of pediatric hypertension is in progress. The harvest from this developing field will depend on our combined participation and expertise.

Sylvester J. Sanfilippo, M.D.
Minneapolis, Minnesota

References

1. Love T A and Moller J H: Blood pressure in children. Minnesota Med 60:631, 1977
2. Minnesota Population Projections, 1970-2000, St. Paul, Mn, State Planning Agency, State Demographer's Office, 1975.
3. Report of the Task Force on Blood Pressure Control in Children. Pediatrics 59:797, 1977.
4. Pediatric Hypertension. Pediatr Ann 6:361, 1977.

Initial Experience with Metolazone

IN THE AUGUST ISSUE Nichols* has reported on a group of forty-four hypertensive patients treated with a new antihypertensive agent, Metolazone.† His report indicates a generally favorable blood pressure response with few side effects. Unfortunately, the number of patients studied is too small and the duration of study too short for this series to be of major significance. In addition, the inclusion in this study of relatively elderly patients with systolic hypertension only was unwise. Some of these patients may not need treatment at all and the lumping of their responses together with the systolic/diastolic hypertensives could result in less accurate analysis of the drug's effectiveness.

The clinician can appreciate some of Nichols' discussion comments. The low incidence of side effects is desirable as asymptomatic patients tend to avoid taking medication causing symptoms. Any medication regimen requiring only one tablet daily is desirable. Drug compliance will always be a problem with hypertension, but it is compounded when more than one tablet or more than one medication daily is prescribed. I would also echo the impression that in spite of much sophisticated research on the renin-angiotension system and the recent delineation of "low-normal-high" renin hypertension types, the cost and inconvenience of obtaining reliable and meaningful results make their regular use impractical at this time.[1]

Bruce Nydahl, M.D.
Minneapolis, Minnesota

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*Nichols, Thomas: Initial Experience with Metolazone. Minnesota Med 60:8:549, 1977.
†Zaroxolyn®

Reference

1 Kaplan, Norman M: Renin profiles JAMA 237:7, August 15, 1977.

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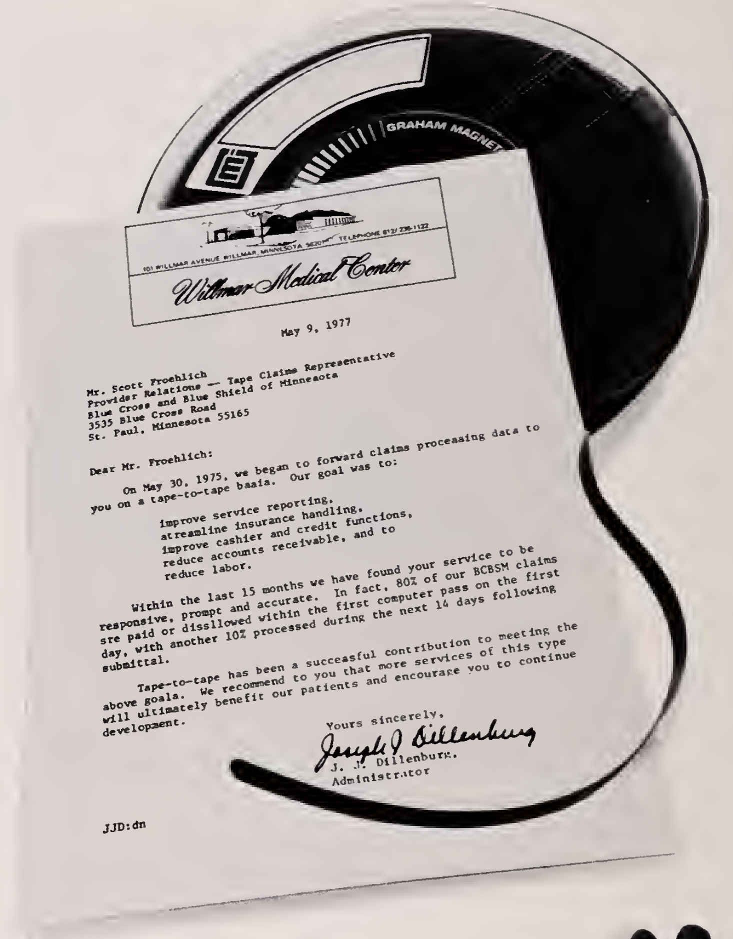

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JJD:dn

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Familial Hemiplegic Migraine

I COMMEND Doctors Parrish and Stevens* for an excellent review of the literature on the problem of the hemiplegic migraine, which fortunately, I find quite rare in my large neurologic practice. I concur with the features most authors point out to diagnose hemiplegic migraine except in my experience, the frequency of attacks is widely spaced in most patients. Sometimes this can be months or years apart, and I rarely have seen it in more than one member of a family.

Carotid angiography in patients with either a history of severe migraine, but especially in patients with a known hemiplegic migraine syndrome is especially hazardous and should be done with extreme caution. A prophylactic dose of 10 mg. of dexamethasone preceding the angiogram is certainly warranted. The advent of computerized tomography of the brain makes carotid angiography avoidable in the majority of the cases.

This author has also used short-term courses of dexamethasone with acute attacks of hemiplegic migraine in an effort to prevent prolonged attacks, and/or permanent residuals. An initial dose of 10 mg. intramuscularly or intravenously is followed by 4 mg. every six hours for 24 to 48 hours. The incidence of side effects using dexamethasone in this manner has been nil in this author's experience.

Richard F. Galbraith, M.D.†
Minneapolis, Minnesota

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*See page 709.

†Associate Clinical Professor Neurology, University of Minnesota and Neurologic Consultant, Minneapolis Clinic of Psychiatry and Neurology, Minneapolis, Minnesota.

Minnesota State Medical Association House of Delegates 1977 Interim Session

The Minnesota State Medical Association House of Delegates will hold its 1977 Interim Session on Friday and Saturday, November 18-19, at the Radisson South Hotel in Bloomington. The schedule has been announced by Dr. James W. Halvorson, Zumbrota, Speaker of the House.

Convening on November 18 at 1:00 pm, the meeting will continue until approximately noon on the following day with delegates from all component medical societies in attendance. Reports from MSMA Committees and resolutions submitted by delegates, members of the MSMA Council, or specialty societies will compose the business for consideration. Topics of current interest include: a final report from the Ad Hoc Committee on Committee Structure completing the planned MSMA reorganization; a report on the feasibility of changing MSMA Councilor District boundaries to coincide with H.S.A. Areas; progress reports from the Health Care Cost Commission and the Ad Hoc Committee on Medical Discipline; and a report concerning the Minnesota State Board of Medical Examiners and the license requirement for continuing medical education.

Doctor Halvorson invites additional business items to be included on the agenda and encourages Minnesota physicians to bring such items to the attention of their respective component medical societies or specialty societies, an Association committee, or the Speaker of the House in care of the MSMA office, CME Department, 101 E. 5th St., St. Paul 55101.

The House of Delegates meeting follows the 1977 MSMA Socio-Economic Conference which begins Thursday, November 17th, also at the Radisson South.

MAY 11-12

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Letters to the Editor

Electrotherapy and Renal Transplantation

Dear Editor:

Regarding Mr. Sammond's Letter to the Editor in the September issue of MINNESOTA MEDICINE,[1] it is to be emphasized that prior to discussing the case with Mr. Sammond, two eminent physicians, one a professor of psychiatry experienced in the use of electrotherapy, and the other a professor of obstetrics and gynecology, were consulted. Both felt that the treatment of choice for the patient's condition was electrotherapy. The professor of psychiatry was chosen as consultant because he had a long experience in the use of electrotherapy and in addition had treated patients taking large doses of cortisone with electrotherapy. The professor of obstetrics and gynecology was chosen, because he had experience in managing transplanted patients who were under considerable emotional and physical strain. As Chief of Psychiatry at the time, the responsibility for recommending temporary privileges to any licensed psychiatrist was mine, so I was certain that the professor of psychiatry would be allowed privileges to consult at the hospital.

It is true that the hospital staff physician did not agree with the consultants, and it was felt obtaining another opinion from a staff physician, who I was sure would agree with me, would not be appropriate medical practice. Incidentally, the patient refused to be examined by the hospital staff physician and by a nephrologist of his choice. Because of the patient's refusal to be examined by these doctors, the physical examination was done by me, and nothing abnormal was found except evidence of the kidney transplant.

To emphasize the irrationality of obtaining one opinion after another, it is evident that I received one opinion regarding proceeding with electrotherapy from the court, while the hospital administration state they received the opposite.

In this particular case three psychiatrists on the hospital staff had seen the patient and approved the use of electrotherapy; two outside consultants agreed to the proposed management; a commitment procedure had been initiated; a verbal approval from the court had been obtained; yet the patient, who was desperately ill, was not allowed to have the treatment she needed until after a court hearing.

I, as a physician, do not feel that emergency treatment of a patient, especially when a life is endangered as in this case, should be a subject for continual debate. In checking with the courts I have been advised that it is a general rule that if a treating physician is reasonably certain there is a life or death situation, it is imperative that he make an immediate decision as to treat or not to treat and proceed.

In summary, the treatment of this case was delayed by others than responsible physicians making decisions, and a patient's life was endangered. Treatment is the responsibility of the patient's doctor as emphasized in the following from the AMA News, August 8, 1977:

> "The 'medical necessity' for *any* medical procedure is dependent upon innumerable factors bearing on the conditions of a patient as judged by the physician, on the basis of his or her training, experience, and judgment. These conditions cannot be listed so as to cover every possibility nor are all conditions applicable in the same way in every situation. Each patient is different and each must be evaluated individually. Therefore, the determination of whether or not a medical procedure should be performed should not be defined by Congress."

As emphasized in the last sentence of our article,[2] procedures must be established in hospitals, so that patients are not prevented from obtaining their rights to proper treatment especially in cases like this where the patient is obviously not able to protect herself; where there is a danger to the patient's life; and where a delay in order to obtain court approval might be fatal.

Irving C. Bernstein, M.D.
Minneapolis, Minnesota

References

1. Sammond, Peter: Letter to the Editor. Minnesota Med 60: 9 665, September 1977
2. Bernstein, IC, Bernstein, DM, and Adzick, GR: Electrotherapy and Renal Transplantation — Impediment to Treatment. Minnesota Med 60, 6, 410, 1977.

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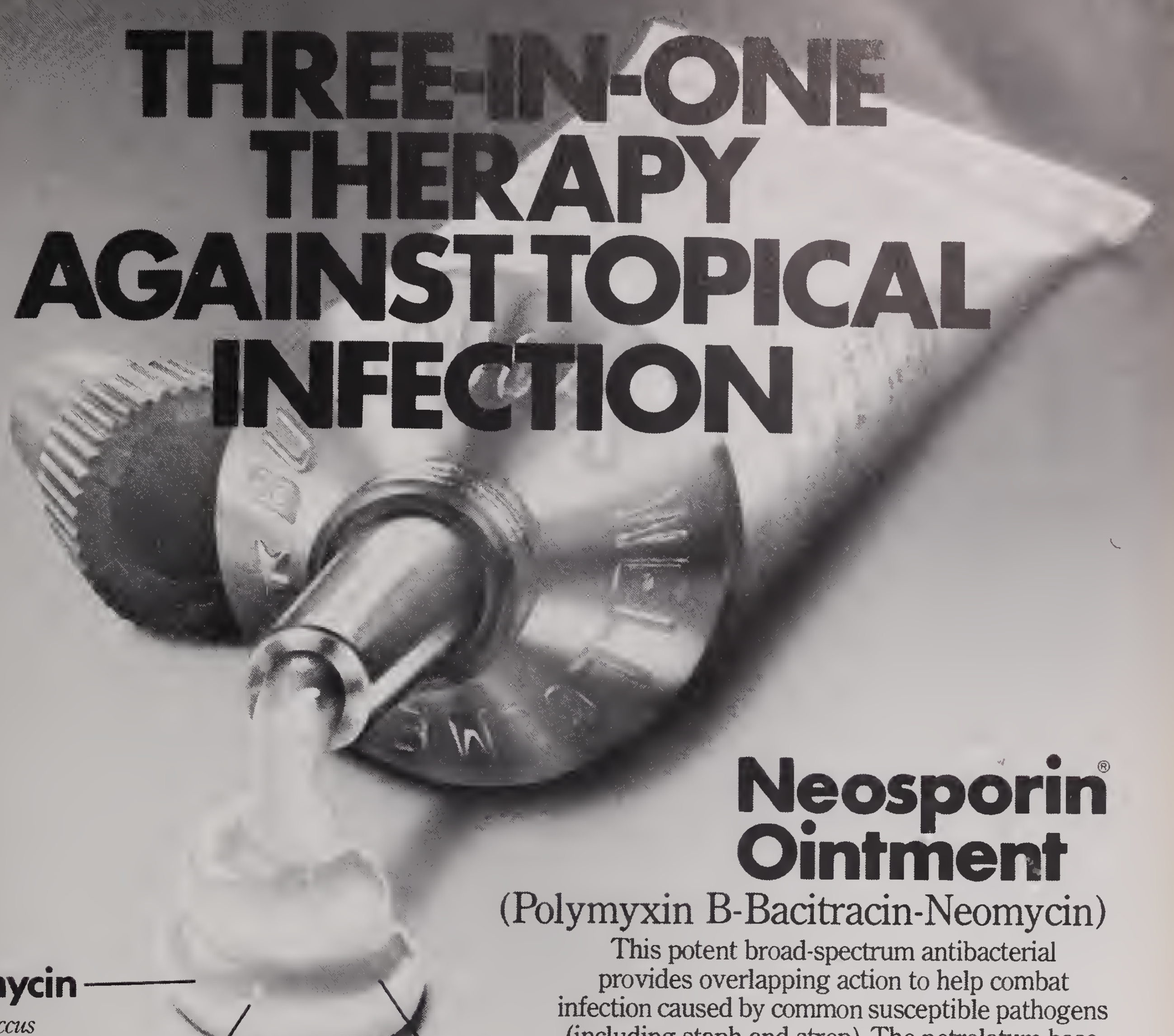

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References:

1 Dornfeld L, Kane R Metolazone in essential hypertension. The long-term clinical efficacy of a new diuretic. *Curr Ther Res* **18** 527-533, 1975

2 Cangiano JL: Effects of prolonged administration of metolazone in the treatment of essential hypertension *Curr Ther Res* **20** 745-750, 1976

3 Data on file: Medical Department, Pennwalt Prescription Products.

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Mr. Roosevelt cal "the cornerstone which is being

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Fervent Interpolation

The President, speaking in the auditorium of the War Memorial Opera House, built in memory of sons of the Golden Gate city who gave their lives in the first World War, in which he himself served, seemed to give unconscious expression to the solemn feeling of the occasion when, at the outset of his speech, he interpolated the words, half a hope, half a prayer:

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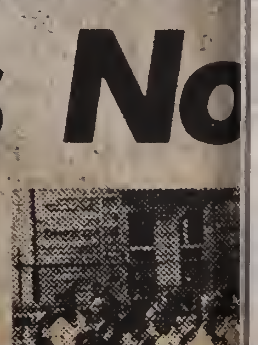

PATIENT PACKAGE INSERTS: A CONCEPT WHOSE TIME HAS COME?

The consumer's right to know is an irreversible and desirable trend of the Seventies. It extends, and properly, to a patient's right to know more about his or her prescription medications. One way, gaining favor, is through patient package inserts. Wisely-prepared and properly distributed when medically indicated, they could markedly improve patient knowledge and drug therapy—laudable goals by anyone's standards.

The PMA endorses these goals and will work with government, the health professions and consumers to achieve them.

The Advantages

The concept holds promise of benefits: better patient understanding of the product prescribed, better adherence to the treatment plan, and more awareness of possible side reactions.

Every doctor has had patients who fail to finish antibiotic regimens because they feel better. Some patients assume that if one tranquilizer or analgesic is good, two may be twice as good. Still others fail to report dizziness while on antihypertensive therapy —and so on.

Problems like these might arise less often if the patient received written information in addition to verbal instructions. Some studies suggest that patients are more receptive to such materials, and they more often understand the verbal instructions and follow them, when inserts are used.

The Disadvantages

There are also some potential problems. Obviously, the inserts must be clearly phrased, without extraneous or complex detail. How much information is enough? How can it be kept current? Should all patients receive the same information? Should inserts be included with all drugs? Should only potential problems be listed or are patients better off with a "fair balance" presentation that describes usefulness as well as drawbacks?

These and similar questions require answers, since model inserts have yet to be properly developed and tested. Despite the need for these studies, the FDA is proceeding prematurely with inserts on selected products. We think the Congress is the only place where the matter can be given the proper legal status and direction, particularly since it represents a conceptual change in the legal, medical and social framework of the nation's prescription drug information system.

The Solution

The PMA believes that carefully-devised pilot studies of various kinds of inserts are needed. They should be developed and implemented with full participation by doctors, pharmacists, consumers, communications experts and the drug industry. Such studies will provide reliable pathways to follow, so that inserts will be useful aids to medical practice.

And particularly we think that you should be closely involved in this debate and in these studies and decisions. Otherwise, people with less experience and qualifications may control the purposes, content and use of a tool with considerable promise for improved patient care. It could make a difference in your practice tomorrow, and more importantly, in the health of your patients.

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(Continued from page 756.)

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(continued to page 777)

Special Article

Rehabilitation of the Patient with Ischemic Heart Disease*

JOHN DAVID HEEFNER, B.A., M.D.†

Among survivors of myocardial infarction over half have significant physiologic, psychologic, and/or sociologic disability. Factors contributing to these disabilities are discussed. Comprehensive rehabilitation efforts are described.

THE GOAL OF REHABILITATION is to restore the patient to optimal physiologic, psychologic, and vocational status, with an additional goal being to prevent the underlying disease from progressing[1]. These goals, traditionally applied to neuromusculoskelatal diseases, apply also to ischemic heart disease.

In 1974 the National Institute of Health issued a task force report on cardiovascular rehabilitation[2]. It revealed that among survivors of acute myocardial infarction over half have significant physiologic, psychologic, and/or sociologic disability. One-third of individuals placed on Social Security Disability during the year preceding the report qualified because of heart disease.

The American Heart Association Heart Facts booklet "We're fighting for your life"[3] estimates that in 1977 over 1,000,000 Americans will have myocardial infarctions; about 650,000 will die. This leaves some 350,000 survivors and, thus, approximately 175,000 individuals in need of rehabilitation.

In Minnesota over 18,000 deaths will occur from cardiovascular disease in 1977[3]. Based on 1974 figures, this means about 12,000 deaths from myocardial infarctions. If the survival rate approaches a third, as indicated nationally, some 6,000 individuals will survive their attacks. Three thousand will likely need specific rehabilitative efforts.

Another problem is depression following myocardial infarction. Its true incidence remains unknown; however it has been described in from 75 to 100% of cases[1,4]. Several investigators think it may be the greatest obstacle to optimal recovering from myocardial infarction. Mortality rates have been reported higher in survivors who experience unresolved depression[5].

Attitudes are changing regarding medical management. For example, lengthy hospitalization following myocardial infarction may not be desirable, and studies show there is no increased morbidity and mortality with discharge after two weeks[6].

There are potential problems with early discharge. Physicians expect more from patients. Earlier return to work and to pre-illness patterns of living are stressed. Patients and their families, however, may be confused. They remember when the admonitions were "to stop working", "to not over-exert", "to take it easy", and they may not understand the new emphases. Employment and insurance companies may not be sympathetic to the individual with ischemic heart disease and may unreasonably peg him a poor risk.

Effects of Immobilization and Inactivity

It has been recognized that the therapeutic benefits of prolonged bed rest once thought necessary for the infarct patient are associated with many well-documented complications. Among them are venous stasis with subsequent thrombophlebitis and pulmonary embolism, significant orthostatic hypotension, progressive increase in heart rate, reduction in circulating blood volume, a fall in muscle strength, a major decrease in maximum total body oxygen consumption, impaired pulmonary function, and the psychological effects of anxiety and depression[7].

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*Description of the Minneapolis Veterans Hospital Cardiac Rehabilitation Program.

†Assistant Professor of Medicine and Psychiatry, Department of Medicine, Section of Psychological Medicine, Veterans Administration Hospital, Minneapolis, Minnesota.

Early Activity and Mobilization

In 1955 Levine and Lown showed patients benefited from sitting in a chair by the third post-infarct day[8]. Over the last several years early mobilization and activity programs have been developed and are associated with few hazards[9,10].

The effects of these programs commonly lead to enhanced cardiovascular functioning when exercise is performed at submaximal loads. Among the beneficial effects are a minimal, but significant, decrease in heart rate, a minimal lowering of systolic blood pressure, a moderate decrease in pressure-rate product/100 and, therefore, in hemodynamic stress on ischemic myocardium, and finally less ST segment depression in post exercise electrocardiograms[11].

Rehabilitation Approach

The goal of rehabilitation has been stated as the restoration of the individual to his or her optimal status physically, psychologically, and socially. Much disability results from failure to recognize and achieve this goal. Therefore, rehabilitative efforts should be directed towards this end. It can be accomplished most effectively by a multidisciplinary approach involving physical therapy, occupational therapy, vocational rehabilitation, dietetics, nursing, psychologically trained physicians, as well as the regular physician staff. Both in-patient and out-patient programs are desirable.*

Education

Educating patients is essential for rehabilitation. Basic information, simplified and repeated, has been most effective. Patients need an elementary understanding of their illness which should include knowledge about coronary arteries, arteriosclerosis, and risk factors. They need to know what the terms angina and myocardial infarction mean. They need to appreciate changes they may have to make in their lives as a result of illness. Specific discharge instructions are essential and ought to include activity prescriptions (see exercise), information about medications, sexual activity[12,13], and about emotions (see psychological support). Families who may serve as stumbling blocks to recovery need to be included in the educational process [14,15]. Many programs have found that the process is best coordinated and administered by a nursing staff specifically trained to perform this function.

Psychological Support

Anxiety following myocardial infarction is often considerable and occurs at predictable times during the hospital stay[4,16,17,18]. Significant anxiety is associated with measurable increases in catecholamine output[19] which may be deleterious to an ischemic and vulnerable myocardium. In the coronary care unit anxiety may be particularly severe. One investigator suggests it is severe enough to warrant treatment routinely with anti-anxiety drugs[18]. The unit itself provides reassurance to many [20]. However, individuals least reassured are those most seriously ill. This early anxiety usually subsides spontaneously. However, anxiety may reappear upon transfer from a monitored unit to a non-monitored environment[17,19,20]. The most effective treatment of this anxiety is its prevention. This can be accomplished by informing the patient beforehand of the transfer and encouraging him that it represents a promotion. Anxiety is observed also upon anticipating discharge and upon witnessing a cardiac arrest.

Depressive responses are common following myocardial infarction. Their onset is predictable, and appropriate intervention may prevent some of the untoward consequences[4]. The early depressive response occurring three to four days after an infarct is appropriate and represents concern over the feared loss of normal heart function and the effects this may have on one's life. There is concern about work, employability, status change within the family, sexual activity, recurrent attacks, and early mortality. Some of these concerns are self-limited and resolve as the individual recovers and realizes he or she will survive. Others may persist leading to the cardiac invalidism syndrome. Feelings of despair and despondency often surface upon returning home. At this time weakness is common and leads to thoughts that the heart really isn't recovering. The security of hospital care and support is gone. The family may be overly cautious about restrictions. Treatment is varied. Early involvement in an exercise program (see exercise) is considered by some the most effective intervention. An understanding of the illness and reassurance about real or imagined limitations heighten confidence. Encouragement of interests and hobbies and followup of these pursuits after discharge help. Involvement in group sessions, while hospitalized and following discharge, has been helpful[14,15]. The use of pharmacotherapy for treatment of post infarction depression is controversial. In general, drugs such as tricyclic antidepressants should be avoided because of their potential toxic cardiovascular side-effects.

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*See description of the Minneapolis Veterans Administration Hospital Cardiac Rehabilitation Program at end of article.

Survivors of cardiac arrest may have special problems[21]. They commonly experience insomnia which may persist for several months. Fear of going to sleep is not infrequent. Repeated dreaming is reported and often centers around violence to self. Transient memory loss is seen and may be of concern to the patient. This loss may not be volunteered and won't be recognized without careful mental status examination.

Exercise

Exercise programs are essential to the rehabilitation effort. Most programs are designed using exercises rated according to energy costs (metabolic equivalents) expressed as multiples of the basal metabolic rate. A metabolic unit (MET) refers to the energy expenditure per kilogram of body weight per minute of an average person sitting in a chair or at supine rest[1]. It is generally accepted that a middle-aged male six to eight weeks following a myocardial infarction is capable of safely performing at eight to nine METS[1]. At this level he would be able to engage in such activities as running at 5.5 mph, cycling at 13 mph, and skiing at 4 mph. If ordinary daily activity results in cardiac symptoms, the performance level would be at about four METS[1]. Most common activities encountered in the areas of self-care, household tasks, vocational pursuits, and recreational choices have been calibrated as to METS required for the activity[1,4,22]. As a result, it is possible to design exercises and activity programs for in-patient and out-patient participation. In-patients are allowed to engage in exercises requiring equivalent amounts of energy expenditure as self-care activities. If they are walking 2.5 mph at discharge without symptoms, they may, for example, make beds upon going home, do light bench work, or go canoeing or bowling. Likewise, if they are able to negotiate a flight of stairs, they can safely engage in sexual intercourse[1,12,13]. These concepts are useful in formulation of specific discharge plans for home, vocational, and recreational activities. They help eliminate many of the ambiguities like admonitions to "take it easy", "do whatever you think is wise", "be careful about sex", etc.

Effects of Rehabilitation Efforts

Because the field is new, the comprehensive effects of cardiac rehabilitation are not known. There seems little doubt about the enhanced confidence and self-esteem patients experience after discovering they can exercise one week after an infarct, that they can and probably should return to their previous employment within six to eight weeks, that they may resume normal sexual functioning, etc. Several reports have indicated that with carefully planned and individualized rehabilitative efforts length of hospitalization is significantly reduced [23,24]. Also observed has been an improved functional status based upon activity and exercise tolerance at the time of discharge[23,24].

Summary

There is a need for a more comprehensive approach to the individual with ischemic heart disease. Prolonged hospitalization is not necessary in most instances. Return to pre-illness level of functioning is possible for many individuals. However, changes in traditional treatment have produced other problems. Patients and their families, who remember that 10 to 20 years ago a heart attack often meant permanent invalidism, may not understand our new approaches. Not infrequently employment and the insurance industry adhere to the unemployability status of individuals with heart disease. This creates difficulty for many persons fully capable of working. Psychosocial intervention and activity prescription need to be added to the medical armamentarium. This can be accomplished best through organized rehabilitation efforts utilizing medical and paramedical disciplines. In this paper a brief survey of some of the problems and crucial aspects of rehabilitation has been presented.

Description of The Minneapolis Veterans Administration Hospital Cardiac Rehabilitation Program

The Minneapolis Veterans Administration Hospital has offered a comprehensive program in cardiac rehabilitation for slightly more than three years. Over 500 patients with angina or myocardial infarction have participated in the program. To date there have been no significant morbidities and no mortalities.

The program is a team approach, the team consisting of physicians, teaching nurses, physical and occupational therapists, dietitian, and vocational counselor. Group meetings for patients and their families are held with one of the team as leader of a discussion. Topics covered in the discussions include basic concepts pertaining to heart anatomy and physiology, coronary risk factors, physical activity and exercise, work simplification, diet, psychosocial adjustments, and vocational rehabilitation. Subjects are repeated weekly therefore providing opportunity for constant review and reinforcement of learning.

Patients are also seen individually at their bedside where more specific and tailored information can be shared. Attention is given to post-discharge activity prescriptions, exercise planning, medications, diet, sexual functioning, return to work, and any other individual problem areas. Those persons thought to be in need of more extensive evaluations are readily referred by one of the team members to the appropriate specialists.

An extensive exercise program is directed by a physical therapist in group settings twice daily. Patients exercise together with each individual progressing at his own level of tolerance. Participants are taught to take their own pulse, to recognize a normal pulse response to exercise, and to know when they need to rest. New exercises demanding more energy expenditure are added for two minutes each day until the patient is exercising 24 minutes twice daily. A cassette tape recording of the exercise program is given to each patient at discharge so he may follow the program at home. Concomittant with the exercise program patients are taught work simplification techniques applicable to home, vocational, avocational, and exercise activities.

Participants are scheduled to return to an out-patient clinic where they receive comprehensive follow-up. The clinic is staffed by the same team that followed the patients during hospitalization. Medical and cardiac status are assessed, psychosocial needs are addressed, exercise programs are reviewed and updated, diets are discussed, and vocational planning and counseling offered. If full rehabilitation has been accomplished and there are no ongoing problems, discharge occurs after the third visit at approximately nine months.

References

1. Hellerstein HK: Rehabilitation of the post-infarction patient. Hosp Pract 7:45, 1972
2. Report of the task force on cardiovascular rehabilitation of the National Heart and Lung Institute: needs and opportunities for rehabilitating the coronary heart disease patient DHEW Pub. No. (NIH) 75-750, December 15, 1974.
3. American Heart Association Heart Facts booklet: "We're fighting for your life" 1976
4. Cassem NH, Hackett TP: Psychological rehabilitation of myocardial infarction patients in the acute phase. Heart and Lung 2:382, 1973.
5. Bruhn JG, Chandler B, Wolf S A psychological study of survivors and nonsurvivors of myocardial infarction. Psychosomatic Med 31:8, 1969.
6. Harpur JE, Connor WT, Hamilton M, et al.: Controlled trial of early mobilization and discharge from hospital in uncomplicated myocardial infarction. Lancet 2:1331, 1971
7. Amsterdam EA, et al. Exercise to put the MI patient on his feet Medical Opinion 4:12, 1975.
8. Levine SA, Lown B. "Armchair" treatment of acute coronary thrombosis. JAMA 148:1365, 1952.
9. Goldschlager N, et al.: Exercise-induced ventricular arrhythmias in patients with coronary artery disease Amer J Cardiol 31:434, 1973
10. Ericsson M, et al Arrhythmias and symptoms during treadmill testing three weeks after myocardial infarction in 100 patients. Br Heart J 35:787, 1973.
11. Bruce RA The benefits of physical training for patients with coronary heart disease Controversary in Internal Medicine II: 146-161, W B. Saunders Co., Phil., 1974
12. Green AW. Sexual activity and the post myocardial infarction patient. Am Heart J 89:246, 1975.
13. Hellerstein HK, Friedman EH Sexual activity and the post-coronary patient Arch Int Med 125:987, 1970.
14. Bilodeau CB, Hackett TP: Issues raised in a group setting by patients recovering from myocardial infarction Amer J Psychiat 128 73, 1971.
15. Adsett CA, Bruhn JG: Short-term group psychotherapy for myocardial patients and their wives. Canad Med Ass J 99:577, 1968
16. Cassem NH, Hackett TP: Psychiatric consultation in a coronary care unit. Ann Intern Med 75:9, 1971.
17. Hackett TP, Cassem NH, Wishnie HA: The coronary care unit: an appraisal of its psychological hazards N Engl J Med 279:1365, 1968.
18. Hackett TP, Cassem NH, Wishnie H: Detection and treatment of anxiety in the coronary care unit. Am Heart J 78 727, 1969.
19. Klein RF, Kliner VK, Zipes DP, et al., Transfer from a coronary care unit: some adverse responses. Arch Intern Med 122:104, 1968
20. Dominian J, Dobson M: Study of patients' psychological reaction to a coronary care unit. Brit M J 4:795, 1969
21. Druss RG, Kornfeld DS The survivors of cardiac arrest: a psychiatric study JAMA 201:75, 1967.
22. Zohman LR, Tobis JS. Cardiac rehabilitation New York, Grune and Stratton, 1970.
23. Grant A, Cohen BS Acute myocardial infarction: effect of a rehabilitation program on length of hospitalization and functional status at discharge Arch Phys Med Rehabil 54:201, 1973.
24. Cohen BS: A program for rehabilitation after acute myocardial infarction Southern Med J 68:145, 1975.

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1. Schiller, F The migraine tradition Bull Hist Med, 49:1, 1975
2. "Classification of Headache". Ad hoc committee on classification of headache JAMA 179 p 717, 1962
3. Clarke, JM. On recurrent motor paralysis in migraine, Brit Med J 1534-1538, 1910.
4. Dynes, JB: Alternating hemiparetic migraine syndrome. Brit Med J 446-447, 1939
5. Whitty, CW Familial hemiplegic migraine J Neurol, Neurosurg Psychiat 16, 172 1953.
6. Blau, JN and Whitty, CWM Familial hemiplegic migraine Lancet 269 1115, 1955,II
7. Ross, RT Hemiplegic migraine Canad Med Ass 78:10, 1958
8. Rosenbaum, HE Familial hemiplegic migraine Neurology 10, 164 1960.
9. Heyck, H (Neurological concomitant manifestations of migraine and the problem of angiospastic brain insult"), Nervenarzt 33:193, 1962
10. Bradshaw, P and Parsons, M Hemiplegic migraine, a clinical study Quart J Med 34, 65 1965
11. Hemiplegic migraine Lancet 1, 896 1965
12. Heyck, H: Varieties of hemiplegic migraine Headache 135-142, 1973
13. Pearce, J. Migraine C C Thomas, Springfield, Illinois, 1969
14. Ohta, M. Skukuro, A. Kuroiwa, Y: Familial occurrence of migraine with a hemiplegic syndrome & cerebeller manifestations Neurology 17, 813 1967
15. Verret, S & Steele, JC: Alternating hemipelgia in childhood: a report of 8 pts with complicated migraine beginning in infancy. Pediatrics 47: 675, 1971.
16. Connor, RCR. Complicated Migraine —a study of permanent neurological & visual defects caused by migraine Lancet 2:1072 1962
17. Murphy, JP: Cerebral infarction in migraine Neurology, 5:359, 1955
18. Symonds, CP: Migrainous variants Trans Med Soc London 67.237 1950-51
19. Dunning, HS Intracranial & extra cranial vascular accidents in migraine Arch Neurol & Psychiat 48 396 1942
20. Selby, G. & Lance, JW Observations on 500 cases of migraine and allied vascular headache J Neurol Neurosurg Psychiat. 23:23, 1960.

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Incest

Detection and Treatment by the Physician

GAIL A. BERNSTEIN, M.D.[*] and ROBERT W. tenBENSEL, M.D., M.P.H.[†]

Incest occurs in the privacy of the home. This is an act which may continue for several years within an apparently intact family. This family secret continues and unlike physical abuse is not readily visible to neighbors, relatives, and school authorities. Thus it creates a problem of detection and delay in eventual treatment.

The problem may be encountered by the family physician as depression which may present in the form of somatic complaints.[1] At times, the depression may be manifested by suicide gestures. Difficulty in school and confusion over sexuality are other presenting complaints which should alert the doctor to the possibility that the child may be a victim of incest.[2]

If a case of incest is suspected, the physician has the responsibility of dealing with the emotional needs of the patient, treating injuries, and obtaining and reporting to the proper authorities accurate data. In this paper recent findings on incestuous families will be presented as well as guidelines for the detection and treatment of incest cases.

INCEST IS ONE of the oldest taboos and has existed universally in all societies. In the past, the topic of incest was seldom discussed, but with the recent concern over physical and sexual abuse of children, the topic is now an important focus of attention. A basic understanding of incest is important for the family physician in recognizing and treating victims of this problem.

Definition of Incest

Minnesota Statutes describes incest as: "Sexual intercourse with another nearer of kin to him than first cousin".[‡] Incest can be classified into three categories: (1) a parent and child, (2) among siblings and (3) among other blood relatives.[3] The focus in this paper will be on father/daughter incest which is the most common type.[4] The term "father" will be broadly interpreted as male parental figure.

The available data on incest deals primarily with fathers who have been convicted of incest or who have been referred into public sector treatment centers. The studies are therefore often biased toward members of the lower class, because this group is most commonly detected while the middle and upper middle class individuals are often not brought into the legal systems.

The Incestuous Father

The studies show that incestuous fathers often left home at an early age to escape an unhappy environment.[1] A 1973-75 pilot study of thirteen incestuous families under treatment in Ramsey County shows that 46 percent of the fathers were physically abused by their parents. In addition, almost half had previous criminal records, and 77 percent were alcoholics or chemically dependent.[2]

The father is usually in his late thirties or early forties when the incestuous relationship begins.[2] The major factor which leads to incest is sexual dysfunction between the husband and wife.[4] For this reason, incest may develop as a defense against the feelings of sexual inadequacy existing in both parents. The fathers are not willing to seek sexual relationships outside the family, because of their need to maintain the facade of a stable, intact family.[5]

Most of the fathers feel little guilt for involving their daughters in sexual activity. Some even believe sexual activity with their children to be a parental right. Quotes from the fathers include: "It is the father's duty to teach his daughter the facts of life the right way" and

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[‡] Minnesota Statutes, 1963 Chapter 609.365.

"when you are ready to have sex, come to me and I'll do it the right way . . . to protect you from harm from other men".[4]

Mothers in Incestuous Families

The mothers of incest victims are described as passive and dependent.[4] Ramsey County's pilot study reveals that these mothers were not abused by their parents, do not have previous police records, and do not abuse chemicals.[2]

These women reject their husbands sexually, and then consciously or unconsciously encourage the eldest daughter to assume a nuturant and/or sexual role with the father.[5] They are often cognizant of the incestuous relationship but use denial to blind themselves to its reality.[1]

The Victim of Incest

Little is known about the personality structure of the incest victims. This may reflect the focus of attention which is placed on the offending father and a tendency to protect the victim from traumatic questioning and embarrassment.[4] The victim is the eldest daughter although there may be subsequent involvement of other daughters. The average age of the daughter when incest begins is eleven years of age. The act may continue for one to three years before it is reported.[2]

In the typical case the first sexual contacts occur after the father has been drinking. He warns his daughter not to tell and threatens physical harm if she devulges the secret or refuses to participate. The victim is afraid to tell her mother, and if she does, the mother often will not believe her.[6]

When an incest victim reaches adolescence, she may learn from her peers that incest is socially unacceptable. It is this social awareness or the realization that other sisters are involved in the incestuous relationship that often allows the victim to report the case. Victims may experience extreme guilt and uneasiness when reporting the incest. The guilt usually results from their feelings of disrupting the home and fears of sending their father to jail, and facing anger, hostility, and rejection from their mother.[1] The fear of becoming involved in the legal system may be a factor in not reporting. In many cases, the victims never are able to openly report the incest case. In these situations, the physician must be attuned to clues indicating that incest is occurring.

Presenting Symptoms

Depression is a common presenting symptom of the incest victim. This may take the form of somatic complaints of fatigue, loss of appetite, insomnia, and aches and pains. The girls may present with abdominal symptoms related to fear of pregnancy.[1] More serious signs of depression may include withdrawal, suicidal thoughts, and gestures.

Difficulty in school is another common problem seen with incest victims. The Ramsey County pilot study found that 69 percent of the victims had difficulty with school work, and 69 percent had poor peer relationships. The overall intellectual functionings of these girls was within normal limits.[2]

The victim often believes that she is to be punished for what has happened.[6] This leads to feelings of worthlessness, and she may enter a period of self destructive behavior manifested by truancy, drug abuse, or juvenile prostitution.[7] A physician should consider incest as an underlying etiology when a young female patient develops the above problems.

Interview and Examination

The interview and physical examination of an incest victim requires special attention and concern on the part of the examiner. The child needs both immediate and long term help. Since the child has had to cope with a dysfunctional family for an extended period of time, a great deal of emotional damage should be expected. It may take intensive professional counseling to deal with the child's guilt and fears resulting from the incestuous experience.

On an immediate basis, the victim needs reassurance, support, and confidentiality. It is best to have the child interviewed by one person.

A major problem to overcome is that of language. Since the child does not know medical terms for the genital organs, communication can be difficult. Dr. Raylene De Vine, a pediatrician at the Children's Hospital in Washington, D.C., has devised a way to deal with this problem by using rag dolls, one with a penis and the other with an obvious vagina. She finds out what terminology the child uses for the genital organs and allows the child to use the dolls to help in explaining her story.[8]

The parents may be equally difficult to interview because the fathers tend to deny the incidents, and the mothers may support the father instead of the child.

Incest differs from other forms of sexual abuse, because by the time it is exposed, there is usually little doubt about the identity of the perpetrator. With incest victims, the physician is not as concerned about treating acute physical injuries and gathering immediate evidence as in rape or other sexual assault cases. Nevertheless, a physical examination is necessary. The type of examination is determined by the history. The doctor focuses on the areas which the child is concerned about.

It is important to explain each step of the examination to the child. According to Dr. De Vine, the physician should look for any changes in the genitalia that indicate a sexual assault may have occurred. These include: redness, bleeding, abrasions, or edema. The size of the introitus is checked. It is usually not necessary to use a speculum.[8]

Attention can be shifted to the oral or anal orifices if the history warrants this. In these areas, the physician looks for similar findings to those described in the vaginal area.[8]

Laboratory Tests[9]

If semen has been deposited on the patient's body, a sample can be obtained for a wet preparation demonstrating sperm motility and for acid phosphatase determination. Acid phosphatase is detectable in semen for up to 36 hours after ejaculation. A second slide should be made and stained. This slide may show sperm for up to 24 hours after intercourse and can be used for sperm typing.

A gonorrhea culture and VDRL should be obtained. If the VDRL is negative and incest has been going on for longer than three months, it need not be repeated. If pregnancy is a serious consideration, a pregnancy test should be obtained. Specimens should be delivered directly to the laboratory and signed for as received since there is a possibility that they will be needed for legal evidence.

Reporting of Examination

After the immediate emotional needs of the child are met and physical examination and lab tests completed, the physician must report the suspected incest case. Any health professional with knowledge that a child is being sexually or physically abused is required to report the case to the Police or Welfare Department according to the 1975 Maltreatment of Minors Reporting Law.* The report should be made immediately by phone or other verbal means. A written report is to follow as soon as possible. The report is to contain the child's name, parents' names, the nature and extent of the child's injury, and the reporter's name and address.

In many areas, special forms are available to fill in the results of the medical examination. It is not necessary to draw conclusions from the results, only to present the data.

Follow-up of Reporting

The referring physician often does not know what happens after a report of incest or abuse is made. The authors have carefully studied the systems for the investigation, handling and follow-up of incest cases in Hennepin and Ramsey Counties. The two counties have followed very different approaches to handling of these cases.

Hennepin County follows the Primary Social Work Model which allows the Welfare Department to take the primary responsibility in the assessment of incest cases. Only as recently as August 1976 has the Hennepin County Welfare Department instituted the policy of reporting all incest and sexual abuse cases to the police for criminal investigation. The philosophy in Hennepin County is to preserve parental and family ties. Hennepin County attempts to keep the abused child in the home and the family intact. Ramsey County follows the Multidisciplinary Team Approach which allows members of different groups including Welfare, Police, County Attorney's Office and medical professionals to share responsibility in making decisions on abuse cases. The focus in Ramsey County is on the child. This county is more likely to actively involve police and courts in the investigative and follow-up processes.

The authors feel that court controls are often necessary. If the child remains in the home without police investigation or pressure from the court, the family will soon withdraw charges and return to the previous pattern. The apparently intact, yet highly dysfunctional family will continue as before. Although the fathers often promise to follow through with therapy, this is highly unlikely without court controls.

Physician's Role

Most important to resolving the problem of incest is the early detection and prevention of the sexual abuse. The family physician must be attuned to the problem and be able to recognize subtle signs of abuse.

The physician must be aware that incest victims may present with physical or emotional complaints. The doctor must use care in approaching and exploring the topic with the patient. After a thorough physical examination and the appropriate laboratory tests, the case must be reported to the local welfare and/or police departments. It is only through early detection followed by the cooperation of disciplines working together that progress can be made toward the protection of children from incest.

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*Minnesota Statutes, 1975 Chapter 626.555

References

1 Kaufman I, Peck A, Taguiri, C The family constellation and overt incestuous relations between father and daughter Amer J of Orthopsych 24:266, 1954
2 Anderson L. Characteristics of parents and incest victims. Presented at the 11th Annual MMPI Symposium, Minneapolis, March 1976.
3 LuKianowicz N Incest I Parental incest. Brit J of Psych 120:301, 1972.
4. Sarles R Incest. Ped Clinics of North America 22.633, 1975.
5. Lustig N, Dresser J, Spellman S, Murray J: Incest: a family group survival pattern Arch of Gen Psych 14:31, 1966.
6 Anderson, L What happens to an incest victim Presented at the Workshop on Adolescent and Youth Abuse and Neglect. Minneapolis, December 1975.
7 Giarretto, H. The treatment of father daughter incest: a psyco-social approach. Children Today 5:2, 1976.
8. De Vine, R: Medical Indicators of Child Abuse and Neglect—Part 5: Sexual Abuse, unit 14. U.S. Department of Health, Education, and Welfare, 1977.
9 Sexual Assault the Target is You. Hennepin County Sexual Assault Services, 1976.[*]

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[*] This helpful manual can be obtained at no cost by writing Ms. Deborah Anderson, Director, Sexual Assault Services, Office of the County Attorney, 200 Hennepin County Government Center, Minneapolis, Minnesota 55487.

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History

Life of William James Mayo, M.D. Surgeon, Scientist, Lover of His Fellow Men

WALTMAN WALTERS, M.D., M.S. IN SURGERY* and
RUTH J. MANN, B.S., L.Sc.†

Both Dr. William J. Mayo and Dr. Charles H. Mayo believed in the educational value of travel. For insight and inspiration, Dr. Will wrote: "nothing can compare with actual observation of and personal meetings with other surgeons." His descriptions of the hospitals he visited, and the surgeons he knew, provide an interesting panorama of an important surgical era.

DR. WILLIAM J. MAYO was born in Le Sueur, Minnesota, in 1861, and died in Rochester in 1939. He became one of the world's great surgeons. In our own country, both Dr. Will and Dr. Charlie received the Distinguished Service (Army) Medal in 1921 for their service in World War I, and in 1934 President Roosevelt came to Rochester to present, on behalf of the American Legion, a citation to both men that read as follows: "For Distinguished Service to Our Sick and Disabled Comrades and to Suffering Humanity."

"In his active professional life of 56 years he became America's most celebrated surgeon, honoured with degrees from twenty-seven universities in twenty different countries." Sir Archibald McIndoe, who had been one of his assistants, was quoted in the same obituary as having written: "In an age of giants, this man stood head and shoulders above the rest, and it is probable the world will never see his like again."[1] Dr. William Haggard of Nashville wrote that he was the surgeon's surgeon.‡ Dr. Mayo's surgical work, his publications, his observations after visits to clinics in this and other countries, and some of his philosophies will be the subject of this paper. To these will be added the personal observations of one of the authors, who not only spent one and a half years as a first assistant to both Dr. Will and Dr. Charlie but also, in his 36 years as a member of the surgical staff of the Mayo Clinic, visited many of the same surgical centers and saw a few of the same surgeons.[2,3]

From the beginning, Dr. Will had his own vision, which was to influence the course of 20th century medicine and surgery. His surgical views have been recorded in his more than 500 papers.

His first paper, published in 1885, was written in collaboration with his father, William Worrall Mayo. Among the six cases reported was an oophorectomy for an ovarian cyst.[4] During the next 10 years he wrote 35 papers on surgical problems of general interest. Toward the end of this period he recorded descriptions of procedures for lesions of the kidney and the female genital organs, but his main surgical interest was in gastrointestinal and biliary surgery. In the next 10 or 15 years, the majority of his papers were on these subjects, including reports of his early visits to surgical clinics in Europe. Seventy papers were written in 10 of these 15 years. He delivered an "Oration on Surgery" at the 55th anniversary meeting of the American Medical Association in Atlantic City in June 1904.[5] Two years later, when he was 45, he gave his Presidential Address at the 57th anniversary meeting of the AMA in Boston on "The Medical Profession and the Issues Which Confront It."[6]

Both Dr. Will and Dr. Charlie believed in the educational value of travel. Indeed, Haggard[7] called them the most traveled American surgeons, and there was scarcely a surgical clinic of any renown that had not seen them as visitors in their galleries at least once or many times in some.

In speaking of the advantage of reading the surgical papers of other surgeons Dr. Will adds,

". . . but this is in no way to be compared with the actual observation of the hospitals and with meeting personally the controlling minds. In this way one may obtain an insight into the psychology of the groups of scientific men, and return from such an investigation stimulated to better work and inspired to higher ideals."[8]

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‡On one occasion a count was made of more than a dozen members of the American Surgical Association, or their wives, who had been operated upon by him.

During his earlier career, Dr. Will made many trips to Chicago to see Christian Fenger, Nicholas Senn, and Charles Parks, Professor of Surgery at Rush Medical College. Albert J. Ochsner, Senn's first assistant, became Dr. Will's close friend. At his first visit to the famous clinic of Samuel David Gross in Philadelphia, he was the last to leave the operating-room gallery after the surgical work was completed. This happened for several days. Finally Gross asked him his name and invited him to make ward rounds with him; they became friends. Visiting Boston, Dr. Will observed that the surgery there was equal to that in New York and Philadelphia and that it was the home of American surgery[9]—surgery different from the West, where surgeons abandoned old and tried methods, which have given good results, for the new methods of some European surgeons.

After his visit to New Orleans, he wrote of the excellence of the medical department at Tulane University, its anatomic and pathologic museum in particular, of the excellence of the Charity Hospital, and of the superior work of Dunn at Tulane, under the direction of Rudolph Matas, Chief of Surgery of Charity Hospital. He mentioned several others on the staff of both hospitals who were doing excellent work. Of Matas he said,

"He is a master of technique and speaker of unusual power and these clinics are most interesting and profitable. I know of none more so . . . . He is an ardent advocate of the use of cocaine as a local anaesthetic . . . by cocainization of the nerve supply."[10]

Altogether, during his active career, W. J. Mayo made many clinical-surgical trips to American and foreign cities, beginning his foreign travel with a visit to Germany and France in 1900.[10] Dr. Will subsequently (between 1901 and 1924) traveled to Canada, England, Scotland, Italy, Switzerland, Austria, Holland, Belgium, Russia, Finland, the Fiji Islands, New Zealand, Australia, Cuba, and South America.

The description of the hospitals he visited and the surgeons he observed provides an interesting panorama of surgery at the beginning of the century, a picture drawn by a perceptive master surgeon.

Of study travel, Dr. Will said that in addition to visiting a clinic,

". . . at least one-half of each day may be spent in seeing the country, the art museums, the universities, and other places of interest, a knowledge of which contributes so much to those sources of contentment within ourselves which make us independent of our environment in later life."[8]

In company with A. J. Ochsner, Dr. Will visited Germany in 1900.[11] In his report of the trip he wrote of the early history of German and French surgery, calling Langenbeck of Berlin, who had revolutionized German surgery, the first great German surgeon. Billroth and Volkmann had been his assistants.

In discussing gastric surgery, Dr. Will spoke of Billroth's and Volkmann's lengthening shadows as followers of Langenbeck, thus preserving his influence. Both of these master surgeons' assistants also became great surgeons and teachers, as did *their* assistants. Billroth had gone to Vienna and Volkmann to Halle. Mickulicz, Czerny, and Wölfler were their assistants, and they formed a group whose contributions to surgery of the stomach for the treatment of gastric ulcer and cancer gave them a great and lasting reputation and did much for the development of gastric surgery.

Von Eiselsberg, one of Billroth's assistants, had gone to Vienna, where he developed a great clinic and, like Billroth and Volkmann, lengthened Langenbeck's shadow as a great surgeon and teacher. It was said that more than half of the surgeons holding chairs in surgery in Germany and Austria had been assistants to Billroth in Berlin or von Eiselsberg in Vienna. Dr. Will urged all American surgeons visiting Europe to attend their clinics.[11]

Perhaps, in part, because of his postgraduate training in 1885 with Arpad G. Gerster of New York, one of the leading exponents of aseptic and antiseptic surgery in the United States, Dr. Will noted the observance, or lack of observance, of this technique by many of the surgeons he visited.[12] In 1900, Dr. Sprengel of Bonn, former assistant of Volkmann, wore rubber gloves, but another of his assistants, Dr. Max Schede of Bonn, and Dr. Franz B. H. Bardenhauer of Cologne, did not. Theodore Tuffier was the only surgeon in Paris that Dr. Will saw wearing gloves.

Dr. Will was always fair and courteous in his comments on the work of other surgeons, but his superlatives were few. Because Dr. Will's praise was so carefully given, his tributes make the stature of the one complimented more impressive. Such was his almost poetic praise of Tuffier:

"Tuffier has scientific imagination. He is a dreamer of true dreams, an investigator of great originality, and a surgeon of rare and unusual ability . . . . Tuffier has earned, and deservedly holds, a place amongst the great surgeons of the day."[13]

Dr. Will's next trip abroad (1907) was to the British Isles.[12] Because of their English ancestry, the Mayos found travel in Great Britain especially pleasant. There was much worthwhile work to be seen. In London, Dr. Will noted that about half of the surgeons wore rubber gloves, and most of these required that their chief assistants wear them also. Most of the operators wore caps. He was glad to see that in many of the hospitals the nurses were compelled to wear a head covering in the operating room.

"Everything that is worth seeing in surgery is readily demonstrated by a short visit to the British Isles," he concluded, but added that:

"To a certain extent the misapprehensions as to the character of English surgery have been founded upon 'a few days in London' by some American students, rather than upon real investigation as to the general conditions, particularly in the smaller cities. London does not represent English surgery in the way that Paris represents the surgery of France. Men who occupy the chief positions in the London hospitals have gained them, to a considerable extent, through long years of patient waiting and working in subordinate positions. By the time they become leaders, their work is more or less crystalized; and, unfortunately, in many hospitals there is no machinery, such as an age or time limit, whereby these men may be retired. Under present conditions it is nearly impossible for a man from the Provinces, no matter how great his ability, to obtain a position on the staff of any of the London hospitals; and, as a matter of fact, a man can seldom change from the staff of one hospital to that of another, which is quite contrary to the best German traditions. This does not mean that the general average of surgical work in London is poor, but it does mean that some of the most modern surgery is to be seen in the provincial towns."[12]

Sir Victor Horseley was one of the surgeons he saw in London for whom he had "a feeling of profound admiration," writing that "in his peculiar line of work, Sir Victor Horseley has no equal."[12] Some of these young provincial surgeons whom Dr. Will visited became his personal friends. True friendships between world-famous surgeons can be an important factor in surgical progress.

Viewed in the perspective of Dr. Mayo's own accomplishments in establishing the largest medical and surgical clinic in the world, a contact he made on a visit to a British provincial city is interesting and important.

In 1907 he had gone to Liverpool to see the distinguished gynecologic surgeon, Thomas F. Grimsdale, operate. When the operating schedule was finished, Dr. Will was asked if he would like to see Mr. Robert Jones of Southern Hospital operate. He did so and later commented on the experience that "for the first time in my life I saw a real orthopedic surgeon." At that time Dr. Will decided that "I must place Mr. Robert Jones as one of the greatest surgeons it has been my good fortune to meet." He never changed his mind, and continued to consider Jones a great diagnostician, operator, and teacher. Taking note of Jones' painstaking and thorough asepsis, his startling precision, his remarkable expeditiousness without neglect of even the smallest detail, Dr. Mayo called him "wizard-like," and continued, "so unassuming and modest is the man that he is, I believe, entirely unaware of his great ability."

Dr. Will marveled at the number of patients that Mr. Jones was able to see—30 to 40 a morning—and the number of procedures he was able to do and still maintain an excellent quality of practice. He noted Jones' method of examining the patient, making a prompt decision and recommendation for treatment, and leaving details of arrangements to be taken care of by others. It is reasonable to suppose that the example of this skilled and efficient method affected the development of Dr. Will's own methods.

Whenever Dr. Will returned to England, he visited Mr. Robert Jones. Sir Arbuthnot Lane and Sir Berkeley Moynihan were two of the other British surgeons whom he visited several times and who also visited him.[14]

In 1912, Dr. Will called Arbuthnot Lane "one of the most interesting figures in British surgery." He credited him with being the first to tie the internal jugular vein for sinus infection in mastoid disease, as well as being most responsible for settling the bitter controversy regarding the open treatment of fractures of bones. ". . . Lane, alone, forced the issue which made the open method for a large variety of fractures accepted by the surgeons of the world."[14]

Dr. Will climaxed his compliments of Arbuthnot Lane when he described his visit to Lane's clinic in August 1913, while attending the International Medical Congress in London and his observations of a number of operations.

"Surgically considered, this work was the feature of the meeting. The operating-room at Guy's Hospital was too small to hold those who desired to see the work. One afternoon Kocher, Bier, Körte, Kümmell, Sauerbruch, Tuffier, Hartmann, Monprofit, Bastianelli, and a host of others were present."[14]

In the same year, Dr. Will wrote:

"The work of Moynihan of Leeds is familiar to us all. . . . He has recently been knighted in merited recognition of his contributions to scientific surgery and is now known as Sir Berkeley. . . . His views are always expressed in beautiful English. I never put down one of Moynihan's writings without a feeling of admiration for him."[14]

The appeal of Moynihan's written works was also apparent in his lectures. The several times he spoke at Rochester there was standing room only in the hall.

"One is sometimes as much impressed with what a man does not do with what he does do,"[14] said Dr. Will, in discussing surgical therapy on his visit to the English surgical clinics of Mr. James Berry, of the Royal Free Hospital, London, where there were a number of female students in attendance. "His work is modern in every detail and is characterized by good judgment and keen concern for the patient's welfare."[14]

The importance of the German surgeons' contribution to surgery in the 19th and 20th centuries is reflected by the number of visits Dr. Will made to Germany—the first in 1900 and two later ones in 1912 and 1913. Twenty-two German surgeons and clinics were visited on these three visits. Also included were other visits to surgical clinics in Austria, Switzerland, Holland, Belgium, Italy, and Great Britain.

On the 1912 visit, Dr. Will visited Professor Kümmell's clinic at the Eppendorfher Krankenhaus in Hamburg.[15] He was particularly impressed by Kümmell, believing him to be a lover of the truth and science, original in his methods, and a splendid surgeon. He wrote of Kümmell's allowing patients up the day after operation because Kümmell believed that this hastened the patient's convalescence. In our present methods of postoperative treatment this procedure has become almost universal practice.

In Berlin (1912) he saw Professor Bier, who had the largest surgical clinic in Germany and was "a worthy successor to Langenbeck," use 0.5% novocain injected into the posterolumbar region supplied by the 11th and 12th thoracic nerves.[15] Bier infiltrated the skin, subcutaneous tissues, and muscles with the novocain solution and removed the kidney through an incision made with the patient under this type of anesthesia. Of Professor Körte, of Berlin, Dr. Will said that Körte enjoyed the respect and confidence of his colleagues as being one of the best general surgeons in Europe, and he also thought Körte's methods were very good.

Dr. Will considered Emil Theodor Kocher (1841-1917), of Berne, one of the most commanding figures in surgery. Having worked with both Joseph Lister and Theodor Billroth, Kocher was a living link with some of the greatest advances ever made in surgery. When Dr. Will had the opportunity of observing Kocher in 1912 he wrote:

"For thirty years the Kocher clinic at Bern has been one of the leading surgical clinics of the world and is still one of the leading clinics. More new and good ideas have come from this one clinic than from any other clinic of my acquaintance, all due to the genius of one man, Theodor Kocher, who is still vigorous with a seemingly perpetual youth. Kocher is constantly at work trying out new things and improving the old. He is an inspiration to surgeons the world over."[15]

In 1912, Dr. Will also enjoyed seeing a great teacher of surgery, Professor Anton von Eiselsberg of Vienna, perform many different kinds of operations, using equal precision and thoroughness for each. He noted approvingly von Eiselsberg's splendid asepsis and his kind and conscientious treatment of his patients. Dr. Will believed that von Eiselsberg's clinic "should be visited by every American surgeon traveling in Europe."[15]

Russia, whether under the czars or the commissars, is not on most medical tourists' agendas. But Dr. Will visited Russia, Finland, Sweden, Norway, Denmark, and Belgium in 1914.[8] He noted that there were nine universities in Russia, six of which had medical schools, one for women. At the medical school in the University of Moscow, which had 300 students, the operating rooms were modern and the clinical laboratories well manned.

He was most interested in the work of Professor Fedoroff of the Imperial Military Hospital, finding him to be an excellent surgeon and justly deserving his reputation for surgery of the kidney:

"He has a remarkable collection of specimens illustrating this type of surgery, and I had the pleasure of seeing him operate on several cases. One was a nephrectomy for pyonephrosis with stone in which he did the subcapsular operation. Very interesting and instructive in detail was the handling of the vascular pedicle. After drawing the kidney well up in the incision, the capsule slipping back, he split the capsule circularly about the pelvis so that the entire pedicle of the kidney slipped through the opening, thus permitting careful ligation of the vessels. I was interested to know that he prefers pyelotomy to nephrolithotomy for stone in the pelvis of the kidney."[8]

As Dr. Will knew, the study of excellence is most pleasurable and profitable. He was also aware of the converse. The story has been told that, at one particular clinic, Dr. Will concentrated his attention unduly to observing the surgical work of one of the surgeons. When one of his friends, who was the chief of surgery of that hospital, asked him why he spent so much time visiting this particular surgeon when there were several others of greater experience and reputation in the same hospital, Dr. Will's reply was: "By watching this particular surgeon I learned more things not to do than ever before." This example of rather caustic wit might have seemed typical to those who only knew him casually.

Dr. Will's fine sense of humor was not often evident to members of the staff during working hours, but sometimes during a difficult operation he would pause for a few minutes to tell a joke or a good story. The laughs which followed broke the tension. An oft-told favorite concerned a man who fell downstairs, picked himself up, and said, "I was coming down anyway!" When Dr. Will read a funny story in a newspaper or magazine he would cut it out and put it in one of his desk drawers for future use. When he heard a good joke he would jot it down and put it in a drawer in his desk to be referred to later.

On many of his trips, of course, Dr. Will not only learned from those he visited but also gave lectures himself. Sometimes, while commenting in the operating room, Dr. Will would give a preliminary version of a talk he planned to present at a meeting, which was also intended for later publication. His talks and papers were not dashed off hurriedly. He spent many hours going over his lectures. Each word, each sentence, had to be just right, and everything was to be said in the fewest possible words.

In writing papers on surgical subjects he often made several drafts, to change wording, to make the paper as brief as possible, and to be sure that he had a strong, informative opening paragraph outlining the reason for the contents of the paper and a final summary that could be used as an abstract and that would intrigue and attract the attention of journal editors and readers.

Whether speaking in his own operating room, presenting a formal lecture, or leading a discussion, Dr. Will made a strong impression on his audience. In writing and speaking he never failed to give credit to the other surgeons for advances in operative technique, wherever and however he had seen, heard, or read of them. This was not a common practice at the time, but this was the policy with both the Mayos. The most outstanding example of Dr. Will's meticulous behavior in this respect has to do with an operation in which the Billroth II gastric resection (anastomosis of the proximal part of the stomach to the lateral side of the jejunum) is performed. Dr. Will thought the operation could be modified safely by a method which would shorten and simplify the surgical procedure and perhaps would be followed by better functional results. This procedure consisted of anastomosing the opened end of the upper part of the stomach to the jejunum, which, in the Billroth II operation, had at first been sutured closed. He had successfully performed this procedure in several cases, had written up his report, and was ready to send it in for publication when he became aware of an article which had been lost in an obscure Austrian journal, written by Polya, of Budapest, in which the same procedure which Dr. Will had described had been used. But Polya found the risk greater than he had experienced with a typical Billroth II type of resection and abandoned the operation. Even so, Dr. Will gave full credit to Polya for a modification of the operation as described and continued to call it the Polya operation, a term that has been accepted over the years.

With these high standards of personal and professional behavior, both the Mayos were excellent representatives of American surgery and of their own institution. Their friendship with many of the surgical greats also had a positive effect on the growth of their reputations. Later, medical and surgical colleagues were benefited by the good will Dr. Will and Dr. Charlie's generosity produced. In 1931, a young surgeon and a young internist from the Mayo Clinic had the pleasure of watching von Eiselsberg perform his last operation in Vienna.[16] They were told that, as his retirement neared, this great surgeon had been offered the presidency of Austria but, after expressing his appreciation for the great honor that such a position would carry, he refused it, saying that he had always been a surgeon and always wanted to be known as a surgeon.

When these two physicians visited Polya's clinic in Budapest in 1931, they had the pleasure of seeing him doing a "Polya" type of resection for carcinoma of the stomach. While he was performing this surgical procedure he recounted to the many visiting surgeons who were observing his surgical work the story about Dr. Will's giving him full credit for the surgical procedure, since he had found it to be successful in 14 cases, whereas Polya's own results in a few cases had seemed to indicate that it was an operation of greater risk than the Billroth II procedure.

Again, in 1931, when these two colleagues of the

Mayos attended the German Surgical Society in Berlin,[17] the President of the Society, Professor von Schmieden, of Frankfurt am Main, invited them to have lunch with him and his family in his home. It was most pleasant. In Kiel, Professor Geheimrat Anschutz also did the same after completing his morning's surgical work. Both professors said that they had visited the Mayo Clinic in 1907, when they were Oberärtzte, where they received a warm welcome. They were house guests of Dr. and Mrs. William J. Mayo, and they had never forgotten their kindness to them. The professors were always glad to welcome foreign visitors to their clinics, especially members of the Mayo Clinic. When they were thanked for their kindness, Professor Anschutz replied with an old German proverb, "They called into the forest and the echo returned."

And the "echo" of the Mayos' teaching and example still lingers.

* * * *

Personal comments by the senior author: I have visited surgical clinics and have become acquainted with outstanding surgeons in the United States and in many foreign countries.[18,19] I have attended their surgical clinics and have been honored by election to many American surgical societies and am honorary or corresponding member of several foreign surgical societies.

Among all of the great surgeons whom I have met on these occasions and with whom I have become well-acquainted and friendly, I think Dr. Will Mayo was one of the greatest men I have ever known and one of the greatest surgeons. He was not only a great surgeon but also a man whose philosophy of life, conduct, and accomplishments surpassed any other surgeon.

The motto "He loved the truth and sought to know it" was framed on his desk, constantly before him, and he truly acted accordingly.

References

1. William J. Mayo (obituary). Lancet 2:347, 1939
2. Walters W: Forty years of surgery at the Mayo Clinic: an autobiographic essay. Perspect Biol Med 7:3, 1963
3. Walters W: Reminiscences of a Mayo Clinic Surgeon (1920 to 1960). 1963, pp 1-114
4 Mayo WW. Mayo WJ: Reports of Drs. W. W. & W. J. Mayo. Trans Minn State Med Soc 17:43, 1885
5. Mayo WJ: The association of surgical lesions in the upper abdomen. (Oration on surgery at the fifty-fifth annual session of the American Medical Association at Atlantic City, June 7 to 10. 1904.) JAMA 42:1545, 1904
6. Mayo WJ: The medical profession and the issues which confront it. (President's address at the fifty-seventh annual session of the American Medical Association at Boston, June 5-8, 1906.) JAMA 46:1737, 1906
7. Haggard WP: In Memoriam: William J. Mayo 1861-1939 and Charles H. Mayo 1865-1939 Ann Surg 111:503, 1940
8. Mayo WJ: A short visit to the surgical clinics of Russia, Finland, Sweden, Norway, Denmark, and Belgium. J Lancet 34:451; 475, 1914
9. Mayo WJ: Post graduate work in Boston (letter to the editor): St. Paul Med J 1:389, 1899
10. Mayo WJ: A medical visit to New Orleans (letter to the editor). St. Paul Med J 2:208, 1900
11. Mayo WJ: Medical notes of a recent trip through Germany and France (letter to the editor). St. Paul Med J 2:725, 1900
12. Mayo WJ: Present-day surgery in England and Scotland from notes made on a recent short visit. J Minn State Med Assoc Northwest Lancet 27:499, 1907
13. Mayo WJ: A visit to some of the hospitals and surgical clinics of France. J Minn State Med Assoc Northwest Lancet 31:405, 1911
14 Mayo WJ: Notes from some of the surgical clinics in Germany, Belgium, and Great Britain, 1913. J Lancet 33:619, 1913
15. Mayo WJ: A short visit to some of the hospitals in Germany, Austria, Switzerland, and Holland. J Lancet 32:423, 1912
16. Walters W: Pathologic lesions associated with duodenal ulcer in Germany and in the United States. South Surg 1:141, 1932
17. Walters, W, Sebening W: A comparison of lesions associated with duodenal ulcer in Germany and in the United States. Minn Med 15:579, 1932
18. Walters W: Russian surgery and the Russian Surgical Congress. Arch Surg 82:191, 1961
19. Walters W: European clinics and international meetings: a visitor's comments. J Int Coll Surg 39:188, 1963

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10. Blackshear PJ, Dorman FD, Blackshear PL Jr, Varco RL, Buchwald H: A permanently implantable self-recycling low flow constant rate multipurpose infusion pump of simple design. Surg Forum 21:136, 1970.
11. Blackshear PJ, Dorman FD, Blackshear PL Jr, Varco RL, Buchwald H: The design and initial testing of an implantable infusion pump. Surg Gyn & Ob 134:51, 1972.
12. Rohde TD, Blackshear PJ, Varco RL, Buchwald H: Chronic heparin anticoagulation in dogs by continuous infusion with a totally implantable pump. Trans Amer Soc Artif Intern Organs 21:510, 1975.
13. Blackshear PJ, Rohde TD, Varco RL, Buchwald H: One year of continuous heparinization in the dog using a totally implantable infusion pump. Surg Gyn & Ob 141:176, 1975.
14. Lee RI, White PD: A clinical study of the coagulation time of blood. Amer J Med Sci 145:495, 1913.
15 Proctor RR, Rapaport SI: The partial thromboplastin time with kaolin. Amer J Clin Path 36:212, 1961.
16. Edson JR, Fecher DR, Doe RP: Low platelet adhesiveness and other hemostatic abnormalities in hypothyroidism. Ann Intern Med 82:342, 1975.
17. Bessey OA, Lowry OH, Brock MJ: A method for the rapid determination of alkaline phosphatase with five cubic millimeters of serum. J Biol Chem 164:321, 1946.
18. Bachra BN, Dauer A, Sobel AE: The complexometric titration of micro and ultramicro quantities of calcium in blood serum, urine and inorganic salt solution. Clin Chem 4:107, 1958.
19. Dryer RL, Tammes AR, Routh JI: The determination of phosphorus and phosphatase with N-phenyl-p-phenylenediamine. J Biol Chem 255:177, 1957.
20. Cameron JR, Sorenson J: Measurement of bone mineral in-vivo: An improved method. Science 142:230, 1963.
21. Edson JR, Krivit W, White JG: Kaolin partial thromboplastin time: high levels of procoagulants producing short clotting times or masking deficiencies of other procoagulants or low concentration of anticoagulants. J Lab Clin Med 70:463, 1967.

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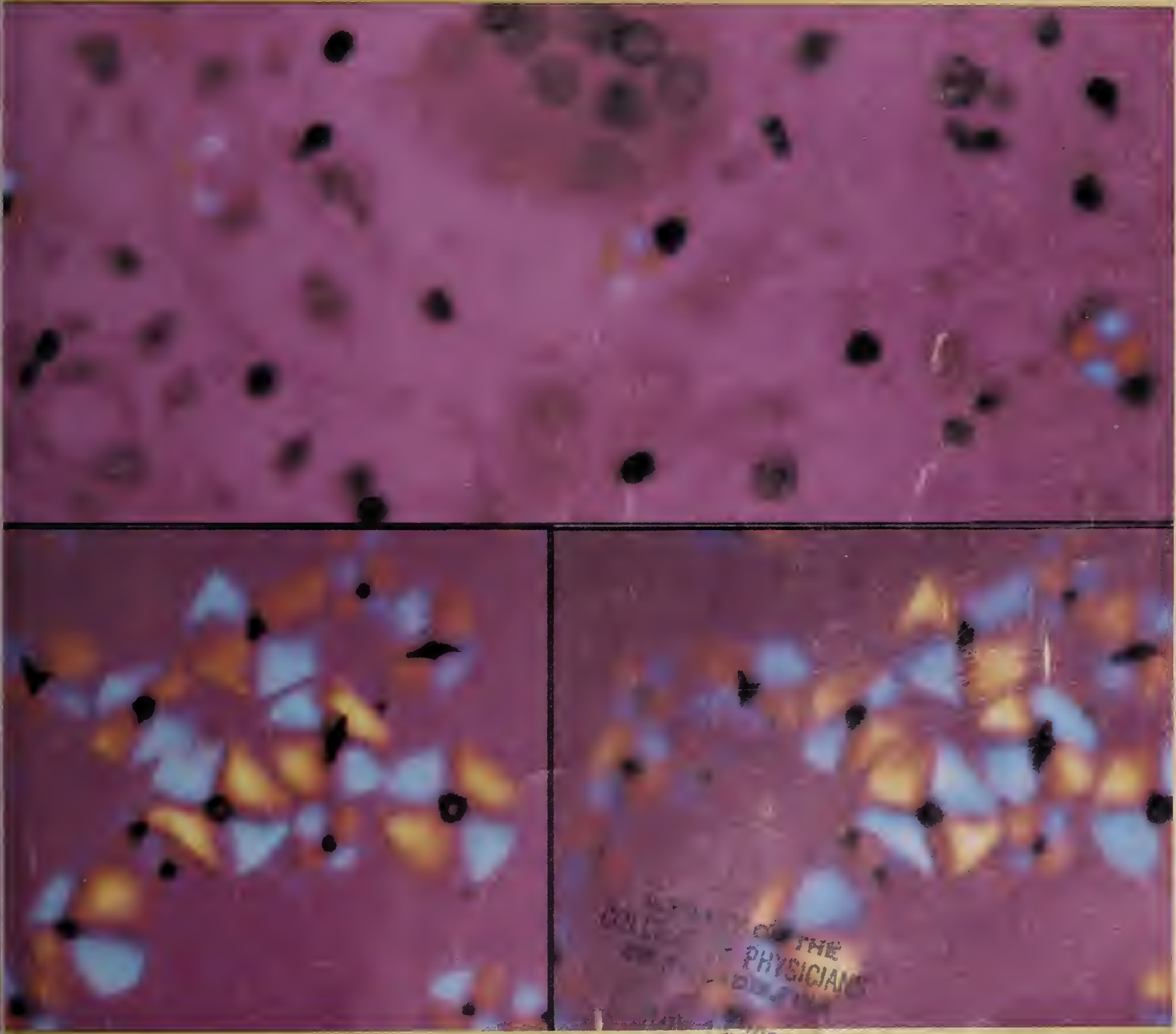

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Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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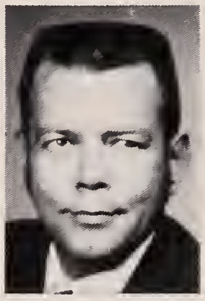

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President's Letter

Who Shall Live?

Philosophically in our Judeo-Christian upbringing, we have not, theoretically at least, had to face this responsibility. We have been taught from childhood on that only the Creator makes this decision. It's not for us to decide or even ask why. Changes in medical technology may indeed be changing all of that, at least for those of us who are practicing physicians. Some modern surgical and medical techniques are already becoming common procedures, and as yet our society has not put any cap on who shall benefit and who shall not. But as the clamor for restrictions of health care costs reaches an ever higher crescendo, the inevitable logical conclusion must be faced—the more expensive procedures must be allocated on some type of priority basis.

Let's just consider a few examples. We are told there are some 300 people being dialyzed in Minnesota today at an average cost of $20,000 a year per individual. That's a six million dollar expenditure per year. There may well be double that number who could benefit from this procedure. Coronary bypass is done almost routinely today at a total cost of from $10,000-$15,000 a procedure. Kidney transplants are a very successful technological surgical procedure—the restraint in numbers depending solely on finding an adequate donor. Cardiac transplants, while falling out of favor currently, may well be reintroduced in greater numbers as our knowledge of immunosuppressant physiology is improved. We have just recently seen the use of intraocular lenses being used at a cost of from $800-$1500 per procedure. All of us have had the experience of referring a premature newborn to a pediatric intensive care unit where it is not unusual to have expenditures of $25,000 for a 25 to 30 day stay. Forty-three percent of hospitals with less than 100 beds now have coronary care units with all the technological equipment that implies. Cost of care in a CCU is three and one-half times that of ward bed care. I am sure all of us could cite other examples of similar expenditures for very special personalized care.

Up to now, this has been not only tolerated but fostered and promoted by physicians, research scientists, government, third party payors, and society in general. None of us can deny that we have not been "carried away" by the almost limitless application of new technology for the care of our patients, patients who 15 years ago would have had no hope at all.

We are told that any and all of us use or develop only 20 percent of our brain capacity in our lifetime. Also we are told that medical knowledge is doubling every seven years. If all researchers would increase their efforts by using 40 percent of their brain capacity, we would perhaps be doubling our medical knowledge every three and one-half years. Staggering figures that boggle the mind. Are they not—and yet possible!!

As research goes on in surgical techniques, physiology of the newborn, immunosuppressant physiology, is it not logical to assume that ten years from now we may be able to do successful pancreatic, lung, and liver transplants to say nothing of cardiac transplants becoming a common procedure. In all likelihood, the primary inhibiting factor will be cost. As these procedures become more possible, they will be performed more frequently on an ever aging population. Will society eventually draw the line? Will the younger generation (who need these things less) finally say "enough" when health care costs entail 25 percent of the gross national product rather than eight percent as they do now? Will someone—the wage earner—call a halt and say enough is enough?

Will we really have a "Logan's Run" situation in our society? What will be the allowable livable age 60-65-70? Will society make the decision that any and all who need will be allowed to have?

We have, since 1966, been fostering a philosophy that all inhabitants of this country, regardless of their ability to pay, have a right to the absolute best of medical care. And this implies the use of all modern technological modalities to foster that care. Politicians have promised, third party payors have paid, and we have provided. Now—inevitably—all have come to the conclusion at the same time that the pricetag is too high.

Legislators say you must be able to provide the same high quality of care for less. Third party payors, including government, say that is what the public wants, and we will give it to them, but the premiums have to go up including that portion of Medicare that the oldsters pay. We, the providers (and I dislike that word immensely), say these things can certainly be provided, but not at reduced or decreased costs. If you cut down costs you are either going to cut down quality or frequency of use of procedures. That is what I have been pointing to throughout this letter. The ultimate, logical goal of cost-cutting is rationing of services and procedures. That is what will ultimately happen! Who will do the rationing? Legislators? Third party payors? We, as physicians? Or society in general? It is a problem that will ultimately have to be solved. I, for one, do not anticipate the responsibility of the entire decision being thrown on the medical profession. But looking at the events of the last ten years, I am fearful that the responsibility will be ours, unless we start now to discuss this problem with our legislators, third party payors, and the public in general.

C. A. Anderson MD

C. A. Anderson, M.D.
President

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It will be a privilege to welcome any and all spouses this year.

Mrs. William G. Halverson
President

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minny and the brood hen

dear doctors
because thanksgiving is near
i was out in the country
talking to my friend the brood hen
i was telling her my boss the editor
was complaining he didn t have time
to fret over his editorials
because of meetings and paperwork
she advanced the philosophy
that meetings and paperwork
are time polluting and are worst
than noise water and air pollution
because time is inelastic
you can t stretch it or pull it
and you can t snap it back
besides she clucked
meetings and paperwork
interfere with creative brooding
good ideas and new thoughts
go through gestational stages
you can t rush them
you can t jump on
and off of them
and give them
occasional warmings
you have to set on them
and brood on them
if you are off running
around the barnyard
making sure all the other fowls
have their procedures right
or their forms in order
you are going to fowl
your own nest or
close the hatch
on your own ideas
i don t think much of her puns
but for a hen
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Rupture of the Extensor Hallucis Longus Tendon While Skiing

FRANKLIN H. SIM, M.D.* and JAMES H. DEWEERD, JR., MD.*

In recent years, a different pattern of injuries has been noted in skiers related to changing ski techniques and equipment. Rupture of the extensor hallucis longus tendon, caused by forced extension of the great toes against resistance, is an unusual injury related to the skiing style of "evalement."

SKIING TECHNIQUES and equipment have changed greatly in recent years. With the advent of high-topped boots providing more ankle support and strength and with the use of shorter skis, skiing with one's center of gravity displaced posteriorly is commonplace. This technique is known as "evalement." The leverage one imparts through the boots to the skis in this position is great and offers better control in most body attitudes than was previously accomplished with lower-topped boots and longer skis. This is a report of an unusual injury sustained while skiing in the manner just described with new equipment. This type of injury has not been reported previously in the literature.

Case Report

A 17-year-old male ski instructor noted the insidious onset of pain and swelling over the dorsum of his right foot about one week after purchasing new boots and skiing vigorously in the evalement style commonly used by the freestyle or "hot dog" skiers. He was unable to wear and buckle his new boot without increased pain and, therefore, sought medical advice. No disability or abnormality other than pain and swelling was noted by the skier.

Examination revealed swelling over the dorsum of the foot, tenderness on palpation, and a poorly defined soft tissue mass. The patient was unable to dorsiflex his right great toe (Figure 1). The tibialis anterior and extensor digitorum tendons were intact, the neurovascular status of the foot was normal, and roentgenograms showed no evidence of abnormality. A diagnosis of acute rupture of the extensor hallucis longus (EHL) tendon was made.

At operation a longitudinal dorsomedial incision was made. The extensor hallucis longus tendon was found to be ruptured in the middle of the foot; the proximal portion retracted under the superior extensor retinaculum and the distal portion retracted to form a mass

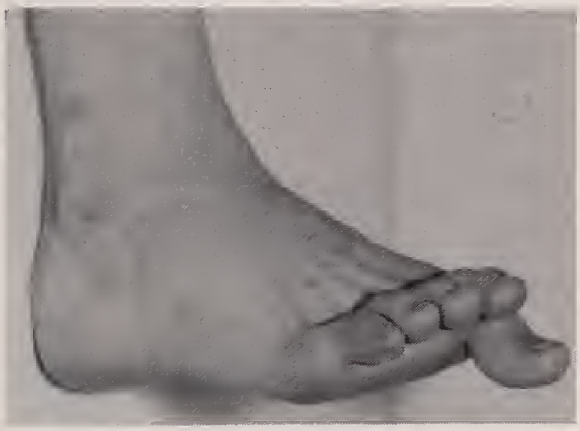

Fig. 1—Before operation, showing inability to extend great toe.

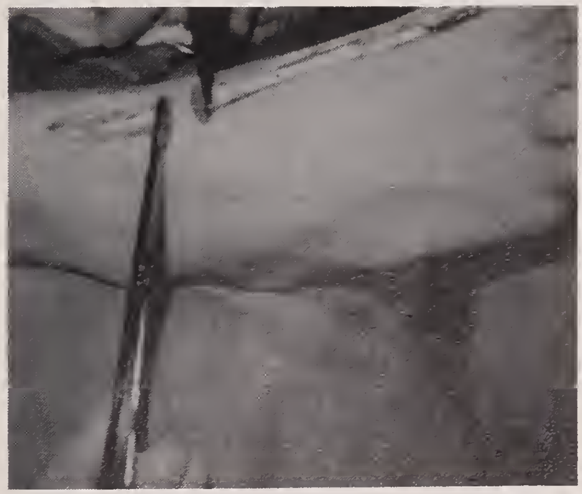

Fig. 2—At operation, demonstrating frayed tendon distal to musculotendinous junction.

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See editorial, page 805.
Address reprint requests to: Dr F. H. Sim.

over the tarsals (Figure 2). The frayed ends were excised and examined histologically but no degenerative changes were identified. A Bunnell end-to-end repair was completed using 3-0 prolene and 6-0 nylon sutures. Immobilization after the operation was continued for eight weeks in a short leg walking cast with the great toe in hyperextension.

Within one month after removal of the cast a full range of active and passive motion of the toe was present. Reexamination one year later showed that full motion and function were maintained (Figure 3).

Comment

Changes in equipment, environments, and styles in professional and amateur athletics can lead to new types of injuries, as we think occurred in this young skier. In skiing, evalement places the body weight far posteriorly, and in order to maintain balance with an upright posture, knee extensors, foot dorsiflexors, and toe extensors are contracting against great resistance in a motion that attempts to unweight the ski tips—in essence, an isometric contraction (Figure 4). This posture, with forced extension of the great toe against a resistance (the boot) in a sustained manner, is the proposed mechanism of action of this interesting and unusual injury. Primary tendon repair within 10 days of the injury provided a good functional result.

Injuries to the extensor hallucis longus tendon reported in the literature[1,2] have been those of typically blunt or penetrating trauma and frequently have been associated with fractures and other predisposing factors. Stress rupture of this tendon has not been reported.

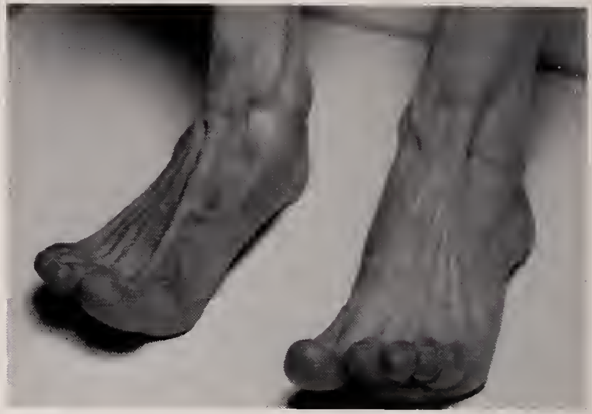

Fig. 3—One year after operation, demonstrating ability to fully extend right great toe.

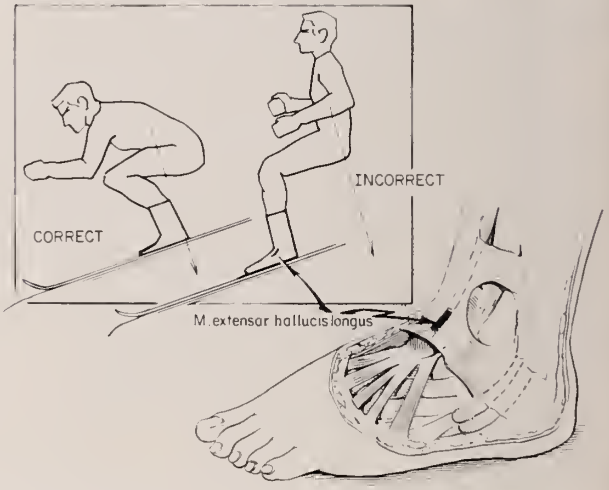

Fig. 4—Proposed mechanism and site of injury.

References

1. Anzel SH, Covey KW, Weiner AD, Lipscomb PR. Disruption of muscles and tendons: a report of 1,014 cases. Surgery 45:406, 1959
2. Lipscomb PR, Kelly PJ: Injuries of the extensor tendons in the distal part of the leg and in the ankle. J Bone Joint Surg [Am] 37:1206, 1955

Ruptured Spleen, Placental Abruption and Toxemia of Pregnancy-Graham (page 809).

9. Wood, WS, Hall, B. Rupture of the Spleen in Subacute Bacterial Endocarditis. Arch Int Med 93:633, 1954
10. Conner, LA, Downes, WA. Spontaneous Rupture of the Spleen in Typhoid Fever With Report of a Case Cured by Operation. Am J Med Sci 147:332, 1914
11. Bryan, RC: Spontaneous Rupture of the Spleen in the Course of Typhus Fever. Ann Surg 50:856, 1909.
12. Diehl, HS: Spontaneous Rupture of the Spleen following a Carbuncle. JAMA 82:951, 1924.
13. Wood, DA. Pathologic Aspects of Acute Epidemic Hepatitis with Especial Reference to Early Stages. Arch Path 41:345, 1946.
14. Fieber, EL. Ueber einen Fall von sogenannter spontaner Milzruptur im Zusammenhang mit Grippe and citriger Blinddarm-Bauchfellentzundung. Wiener Klinische Wochenschrift 34:581, 1920
15. McCoy, JC: Splenectomy for Rupture of Spleen. Ann Surg 54:591, 1911.
16. Illtyd, J, Wilson, AJ: Spontaneous Rupture of the Spleen in Sarcoidosis. Br J Surg 33:280, 1946.
17. Rubnitz, AS: Spontaneous Rupture of the Spleen Due to Acute Leucemia. J Lab Clin Med 28:972, 1943.
18. Abell, I: Wandering Spleen with Torsion of the Pedicle. Ann Surg 98:722, 1933.
19. Aronson, W, Fox, RA: Spontaneous Rupture of the Pathologic Spleen. Am J Clin Path 10:868, 1940.
20. Susman, MP: Spontaneous Rupture of the Spleen. Br J Surg 15:47, 1927.
21. Haller, AP, Abells, DW, Straus, R: Spontaneous Rupture of the Liver in a Patient with Nonconvulsive Eclampsia. Am J Obstet Gynecol 62:1170, 1951.

Bilateral Congenital Posterolateral Diaphragmatic Hernia

CHARLES R. NICOLOSI, M.D.:* DONN LEAF, M.D.;* and ROBERT SCHULENBERG, M.D.*

A case of a congenital bilateral posterolateral diaphragmatic hernia is presented. Only five cases are reported in the last 70 years. Pertinent x-ray findings are discussed as well as embryologic considerations.

CONGENITAL BILATERAL posterolateral diaphragmatic hernia (Bochdalek hernia) is very rare. Review of the pediatric, surgical, and radiologic literature revealed only five reported cases in the last 70 years.[2,3,5] We wish to report an additional case.

Case Report

The patient is a newborn premature male of a gravida I mother with a bicornuate uterus. The birth weight was 3 lb. 10 oz. and the gestational age was 30-32 weeks. At birth, the child could not establish spontaneous respirations. Despite endotracheal intubation, no change in ventilatory capacity resulted and the heart sounds became depressed. The child became acidotic and an umbilical artery catheter was inserted. A chest Xray (Figure 1) demonstrated the stomach as well as numerous loops of bowel in the left hemithorax as well as complete opacification of the right hemithorax. The child was immediately taken to the operating room. At surgical exploration, the posterior portion of the left hemidiaphragm was found to be congenitally absent and a Marlex diaphragm-plasty was done. A postoperative chest film (Figure 2) revealed persistent opacification of much of the right hemithorax with the superior margin of the liver seen to good advantage. The child remained acidotic after surgery and expired one hour later.

An autopsy was performed which showed bilateral posterolateral diaphragmatic defects, with the left repaired. The left lung was hypoplastic and the right lung was anatomically normal. The liver had herniated into the right hemithorax. Incidentally found were a triple right ureter and a double left ureter.

Discussion

Unilateral congenital diaphragmatic herniation through the foramen of Bochdalek occurs once every 2,500 live births; it is four times as common on the left as on the right[4]. Bilateral occurrence is extremely rare. A review of the pediatric, surgical, and radiologic literature revealed only five reported cases in the last 70 years.[2,3,5]

The septum transversum begins separation of the thoracic and abdominal cavities by arising ventrally between the liver and heart and moves dorsally and medially where it meets a portion of dorsal mesentery. The lateral rims of the diaphragm are derived from musculature of the lateral body wall. The remaining posterolateral portion is the last to develop and is enclosed by the pleuroperitoneal membrane. The

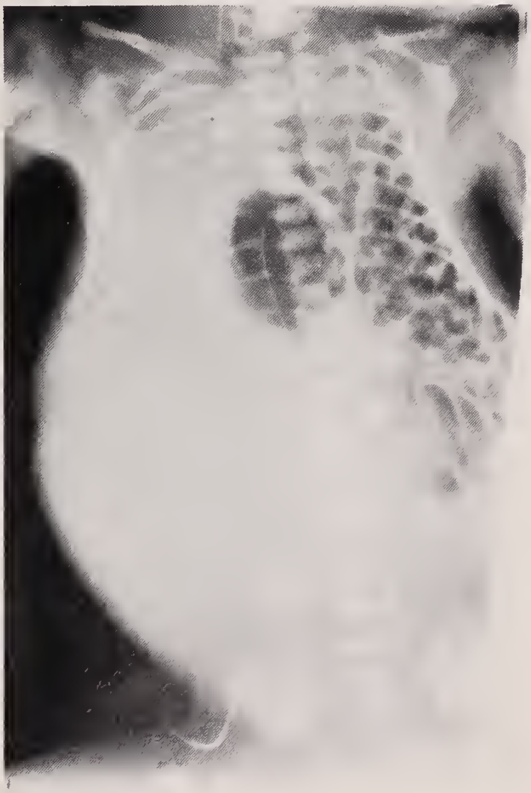

Fig. 1—Note opacified right hemithorax, as well as stomach and loops of bowel in left hemithorax.

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*St. John's Hospital, Red Wing, Minnesota.

pleuroperitoneal canal is the foramen of Bochdalek and is normally closed by the eighth week of fetal life. During the tenth week the intestines return from the yolk stalk to the abdominal cavity and in the third fetal month, rotation and fixation occur to place the stomach, duodenum, and colon in their permanent positions. It is postulated that either early return of intestines into the abdominal celomic cavity or delayed closure of the pleuroperitoneal membrane will result in herniation of the abdominal viscera into the thorax through the patent pleuroperitoneal canal and thus create a hernia through the foramen of Bochdalek[6].

An opacified right hemithorax as seen in Figure 1 usually indicates ipsilateral displacement of the mediastinal structures away from the left hemithorax with secondary compression or atelectasis of the right lung. The radiologist should also consider the possibility of a right-sided Bochdalek hernia.

The overall survival rate in infants for surgical repair of unilateral left-sided posterolateral diaphragmatic herniation is 78.6%.[6] In three of the five reported cases of bilateral herniation, the right-sided defect went unrecognized and these patients died within twenty-four hours after surgery, as did the present case. The two main causes of death in this entity are pulmonary insufficiency and cardiac failure.[1] If the surgeon is alerted to the possibility of a second defect, the survival rate of these infants may be measurably increased.

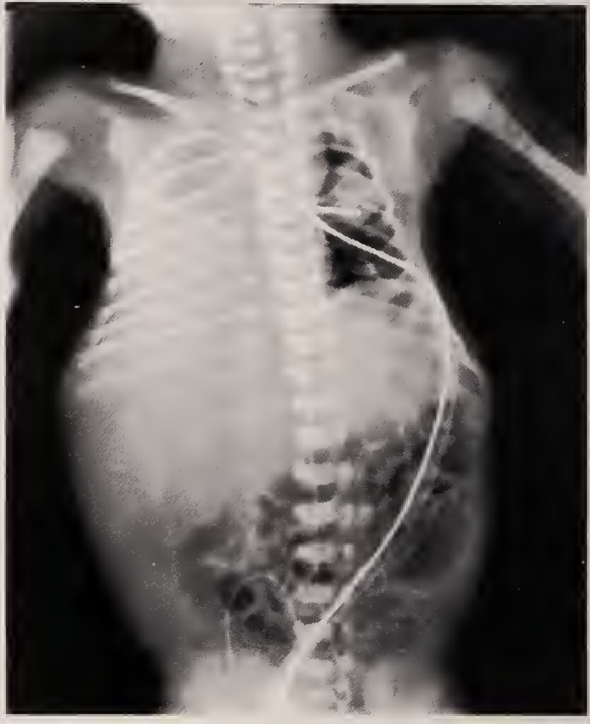

Fig.2—Note superior margin of liver in the right hemithorax. This is seen to better advantage than in the preoperative exam.

References

1. Allen MS, Thomson SA: Congenital diaphragmatic hernia in children under one year of age: A 24 yr. review. J Ped Surg 1:157, 1966.
2. Bowers VM, McElin TW, and Dorsey JM: Diaphragmatic hernia in the newborn. Obstet Gynec 6:22, 1955.
3. Fitchett, CW, Tavarez V: Bilateral congenital diaphragmatic herniation: Case Report. Surg 57:305, 1965.
4. Kissane JM: Pathology of Infancy and Childhood. St. Louis, Mo. CV Mosby Company, 2nd Edition. pp. 560-562, 1975.
5. Levy JL, Guynes WA, and Louis JE: Bilateral congenital diaphragmatic hernias through the foramen of Bochdalek. J Ped Surg 4:557, 1969.
6. Whittaker LD, Lynn HB, and Dawson B: Hernias of the foramen of Bochdalek in children. Mayo Cl Proc 43:580, 1968.

MINNESOTA MEDICINE

The Board of Editors of MINNESOTA MEDICINE invites the members of the Minnesota State Medical Association to submit examples of their art work for publication on the cover of MINNESOTA MEDICINE. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of MINNESOTA MEDICINE, 101 East 5th St., Suite 900, St. Paul, Minnesota 55101.

Farrell Stiegler, M.D.
Cover Editor

5-TU PPD Tuberculin Skin Test

A Comparison of Readings at 24 and 48 Hours

SANDRA J. FRANZEN, R.N.* and RICHARD A. DEREMEE, M.D.*

Of a group of 102 patients receiving a 5-TU PPD tuberculin skin test 23 had positive reactions at 48 hours, 19 of which were positive at 24 hours. The significance of this finding is discussed.

TUBERCULIN SKIN TESTING has been done since 1890, when Koch first isolated tuberculin from the tubercle bacillus.[1] In 1934, Seibert further perfected the test by precipitating PPD-S,[2] the equivalent of the PPD that is in current use. Many studies have evaluated the specificity and reliability of the skin test.[3–5] An induration of 10 mm or greater with the 5-TU PPD skin test indicates tuberculous infection, and this magnitude of reaction has been adopted by the National Tuberculosis and Respiratory Disease Association as being a positive tuberculin skin test when read between 48 and 72 hours.[6,7]

The purpose of our study was to determine the reliability of reading the tuberculin skin test at 24 hours.

Methods and Materials

A group of 102 patients was given an intradermal tuberculin skin test utilizing purified protein derivative. Five tuberculin units were given into the anterior surface of the left forearm. The reaction was evaluated at 24 and 48 hours by measuring the induration in millimeters. An induration of 10 mm or more was considered to be a positive skin test reaction, with anything less being a negative reaction.

Results

Of the 102 skin tests, 23 were positive at 48 hours; 19 of these were positive at 24 hours (Table). Thus, there were four false-negative readings at 24 hours. Two patients had positive reactions at 24 hours, but these became negative at 48 hours. Seventy-seven patients had negative readings at both 24 and 48 hours.

One of the patients with a false-positive reaction had an induration of 8 mm at 48 hours after having an induration of 10 mm at 24 hours. The other patient had no induration at 48 hours. On retesting, this latter patient had no reaction at either 24 or 48 hours. This type of apparent early reaction has been described by Zinsser[8] in 1921 and by Lewis[9] in 1927. It was referred to as an atypical nonspecific reaction due to liberation of a histamine like substance and was not considered a true tuberculin reaction.[1] This possibility was one of the reasons for reading the "old" tuberculin (OT) skin tests on the second day.

On reviewing the history of the patient with an 8-mm reaction at 48 hours (10 mm at 24 hours), we found that her father-in-law had had tuberculosis and that her husband was a positive tuberculin reactor. Some authorities believe that an induration of 5 to 9 mm in a patient with known contact should be regarded as positive.[5] The reaction that we observed in this patient may have been indicative of tuberculous infection. She has since died of cancer of the lung; and no autopsy was performed.

Our study revealed that, by reading the 5-TU PPD skin test at 24 hours, we had only a 6% error when we used the reading at 48 hours as the final criterion. That

TABLE
Readings of 5-TU PPD Skin Test in a Series of 102 Patients

Readings		No. of patients
At 24 h	At 48 h	
Pos.	Pos.	19
Neg. (false negative)	Pos.	4
Pos. (false positive)	Neg.	2
Neg.	Neg.	77
Total		102

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[*] Division of Thoracic Diseases and Internal Medicine, Mayo Clinic and Mayo Foundation, Rochester, Minnesota.

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See editorial, page 803.

is, only six tests were either false negative or false positive.

Discussion

Because many patients may come from a great distance when seeking medical attention, the use of the 24-hour 5-TU PPD test reading in place of the 48-hour reading would be helpful in decreasing their stay. Our study demonstrated that the 5-TU PPD skin test is positive at 24 hours in more than 80% of patients who have positive reactions at 48 hours.

References

1. Hart PD: The value of tuberculin tests in man, with special reference to the intracutaneous test. Med Res Counc Spec Rep Ser (Lond) 164:3, 1932.
2. Committee on Diagnostic Skin Testing of the American Thoracic Society: What is PPD-S? Am Rev Respir Dis 99:460-461, 1969.
3. American School Health Association. Tuberculin Testing. A Critical Evaluation. Proceedings of a Panel Discussion of the American School Health Association Convention, San Diego, California, pp 5:7, October 1972
4. Edwards LB, Comstock GW, Palmer CE: Contributions of northern populations to the understanding of tuberculin sensitivity. Arch Environ Health 17:507-516, 1968
5. Seibert FB: The isolation and properties of the purified protein derivative of tuberculin. Am Rev Tuberc 30:713-720, 1934
6. Committee on Diagnostic Standards: Diagnostic Standards and Classification of Tuberculosis. Twelfth edition. New York, National Tuberculosis and Respiratory Disease Association, 1969
7. Committee on Diagnostic Skin Testing. The Tuberculin Skin Test: Supplement to Diagnostic Standards and Classification of Tuberculosis. New York, National Tuberculosis and Respiratory Disease Association, 1971.
8. Zinsser H: Cited by Hart PD, p 53[1]
9. Lewis T: Cited by Hart PD, p 53[1].

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Accredited in Continuing Medical Education

At its last meeting in September, the Liaison Committee on Continuing Medical Education (LCCME) granted accreditation in continuing medical education to the following Minnesota hospitals: Rice Memorial Hospital, Willmar; Children's Health Center & Hospital, Minneapolis; Methodist Hospital, Minneapolis; and Metropolitan Medical Center, Minneapolis. The MSMA Subcommittee on Accreditation has processed full accreditation for a total of ten hospitals to date, including North Memorial Hospital, Minneapolis; St. John's Hospital, St. Paul; Hibbing General Hospital, Hibbing; Abbott Hospital, Minneapolis; St. Cloud Hospital, St. Cloud; and St. Luke's Hospital, Duluth.

The Subcommittee on Accreditation, with a network of volunteer consultants, conducts accreditation surveys and provides CME consulting services for institutions sponsoring CME in Minnesota. The program is under the authority of the LCCME, a national committee with members representing the public, the Federal Government, and seven national health-related organizations, including the AMA.

Information concerning the accreditation process may be requested through the Department of CME & Program Services, Minnesota State Medical Association, Suite 900, American National Bank Building, 101 East Fifth Street, St. Paul, MN 55101, (612) 222-6366.

Special Article

Starch Granulomatosis
A Preventable Iatrogenic Disease

FARRELL S. STIEGLER, M.D.*

Starch on rubber medical surgical gloves should be meticulously removed.

IN 1847, SEMMELWEIS initiated the eradication of puerperal sepsis by urging physicians to wash their hands (in a calcium chloride solution) between patients when examining women in labor. Unknowingly, he compelled them to remove from the skin of their hands the unseen and as yet undiscovered microorganisms that caused the lethal infections. Today, surgeons are causing a less lethal, but nevertheless, incapacitating disease by a seen but ignored agent on their gloved hands. The starch powder dusted on surgical gloves to facilitate donning can be a potent antigen producing an intense granulomatous reaction in any tissue into which it is inoculated.

Two brief case summaries illustrate the clinical features of starch granulomatosis.

Case Reports

Case 1

A 47-year-old white male was admitted to Fairview Hospital, Minneapolis, on January 30, 1968, with the signs and symptoms suggestive of acute appendicitis. This was confirmed at laparotomy, and appendectomy was performed without incident. The post-operative course was uncomplicated, and the patient was released from the hospital on February 4, 1968. He was readmitted to the hospital on March 6, 1968, complaining of mid-abdominal pain which had started ten days prior to this second admission. The pain increased steadily and became localized again in the right lower quadrant. Physical examination revealed the abdomen to be tense and tender throughout. There was rebound tenderness, but no masses were present. The appendectomy scar was well healed and showed no evidence of suppuration. Hemoglobin was 13.3 gm, white blood count was 5300 with 77 percent neutrophils. The patient was observed for 24 hours, and his symptoms increased. Because of the possibility of an intra-abdominal abscess, he was re-explored on March 13, 1968. Laparatomy revealed 1500cc. of serous fluid in the abdominal cavity. There was no purulent component to this fluid. A large granulomatous mass was found in the right half of the omentum. This mass was adherent to the previous scar, to the cecum, and to the ascending colon. There was no perforation of the appendiceal stump. As much of the omental mass as could be easily removed was resected, and the patient made an uneventful recovery. Histologic examination of the omentum revealed a severe granulomatous reaction containing starch crystals under the polarizing microscope.

Case 2

A 29-year-old white female was admitted to Fairview Hospital on December 22, 1976 complaining of abdominal pain and distention. She had undergone a cholecystectomy and appendectomy at another hospital on December 3, 1976. Her post-operative course had been uncomplicated, and she was released from that hospital in five days. On December 17, 1976, 14 days after surgery, she experienced intermittent right upper quadrant pain. The pain increased in severity and became constant, and she became nauseated. She had a normal bowel movement on the day prior to admission but none since. She became chilled and had a mild temperature elevation. Her past surgical history revealed that she had "back surgery" at age 14 and a Cesarean Section in February of 1976. Both of these operations were endured without complications.

Physical examination revealed a well-developed and well-nourished white female in obvious distress. There was a healing right subcostal surgical scar with no evidence of suppuration. The abdomen was slightly distended, and there was marked tenderness over the entire lower abdomen. Rebound tenderness was present, but no masses could be felt. Her hemoglobin was 13.3 gm., white blood count was 18,400, and there was 85 percent PMNs. Her sedimentation rate was 61. Urinalysis was normal. Flat plate Xray of the abdomen revealed a localized ileus, but no evidence of mechanical bowel obstruction or of an intra-abdominal abscess.

During 24 hours of observation her pain and white blood count increased. On the suspicion that she had had a peritonitis due to a bile leak or a subphrenic abscess, she was explored. Laparotomy revealed a marked inflammatory reaction in the gallbladder bed extending about the duodenum. This had the appearance of the reaction that one sees with a perforated duodenal ulcer, but no perforation could be found. A similar granulomatous reaction was present about the terminal ileum and cecum suggesting a "blown" appendiceal stump; but, again, no performation could be demonstrated. The large amount of serous fluid in the abdomen was cultured and drained. On suspicion of a starch granuloma, a section of the thickened omentum was removed for histologic study.

Culture of the abdominal fluid was sterile. The omental tissue showed a severe granulomatous reaction containing the typical birefringent crystals of starch under the polarizing microscope. The patient was placed on diminishing doses of Solu-Cortef postoperatively, and she improved rapidly. She was released from the hospital on December 31, 1976 and completed her convalescence without further complication.

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*Cover Editor, surgeon and Assistant Clinical Professor of Surgery, University of Minnesota, Minneapolis, Minnesota.

See cover of this issue of Minnesota Medicine.

Discussion

The first lubricant powders on surgical gloves were talc (magnesium salicate) and lycopodium spores. In 1933, Antapol reported that these substances could produce severe foreign body reactions in tissues and their use was subsequently discontinued. Research to find a nonreactive powder ended with the discovery of starch powder which was said to be harmlessly absorbed from tissues. But in 1957, there began to be reported increasing numbers of cases of granulomatous reactions due to starch. At first these reports described only intraperitoneal reactions; but, later granulomas in all tissues, including the brain, eye, skin, and bone were observed. Starch vaginitis and peritonitis were reported to have been caused by pelvic examinations, the starch reaching the peritoneal cavity via retrograde migration through the uterus and fallopian tubes.

It must be surmised that reactions to starch probably occur far more often than is reported in the literature. All degrees of reaction may occur, and the less severe reactions are not reoperated upon to provide tissue for histologic examination. Minor reactions subside without discovery.

There is some evidence, as suggested by Bates[3] in 1965 and Holgate[7] in 1973, that the starch reaction is not a simple foreign body reaction, but a true hypersensitivity reaction; and, therefore, occurs only in the few individuals who are sensitized to starch.

In order for this diagnoses to be made, both the surgeon and pathologist must be aware of this entity. Clinical symptoms start 10 to 14 days after an uncomplicated surgical operation. Symptoms increase slowly and simulate an infection. Physical signs are also suggestive of infection, but supporting laboratory tests may be inconclusive. In many instances re-exploration may be necessary despite the possibility of starch granulomatosis, because the presence of an abscess cannot be ruled out by any other means. At that time, the surgeon should be aware of the appearance of starch granulomas so as to avoid an unnecessarily extensive exploration or resection. The reaction usually will subside spontaneously in several weeks. Steroids have been administered to hasten its resolution.

The pathologist must also be aware of the reaction in order to look for the telltale starch crystals. He must examine the tissue with a polarizing microscope, in order to see the characteristic maltese cross, birefringent crystals of starch as illustrated on the cover. It is also necessary to see these crystals within macrophages and not merely on the surface of contaminated tissues in order to confirm the diagnosis.

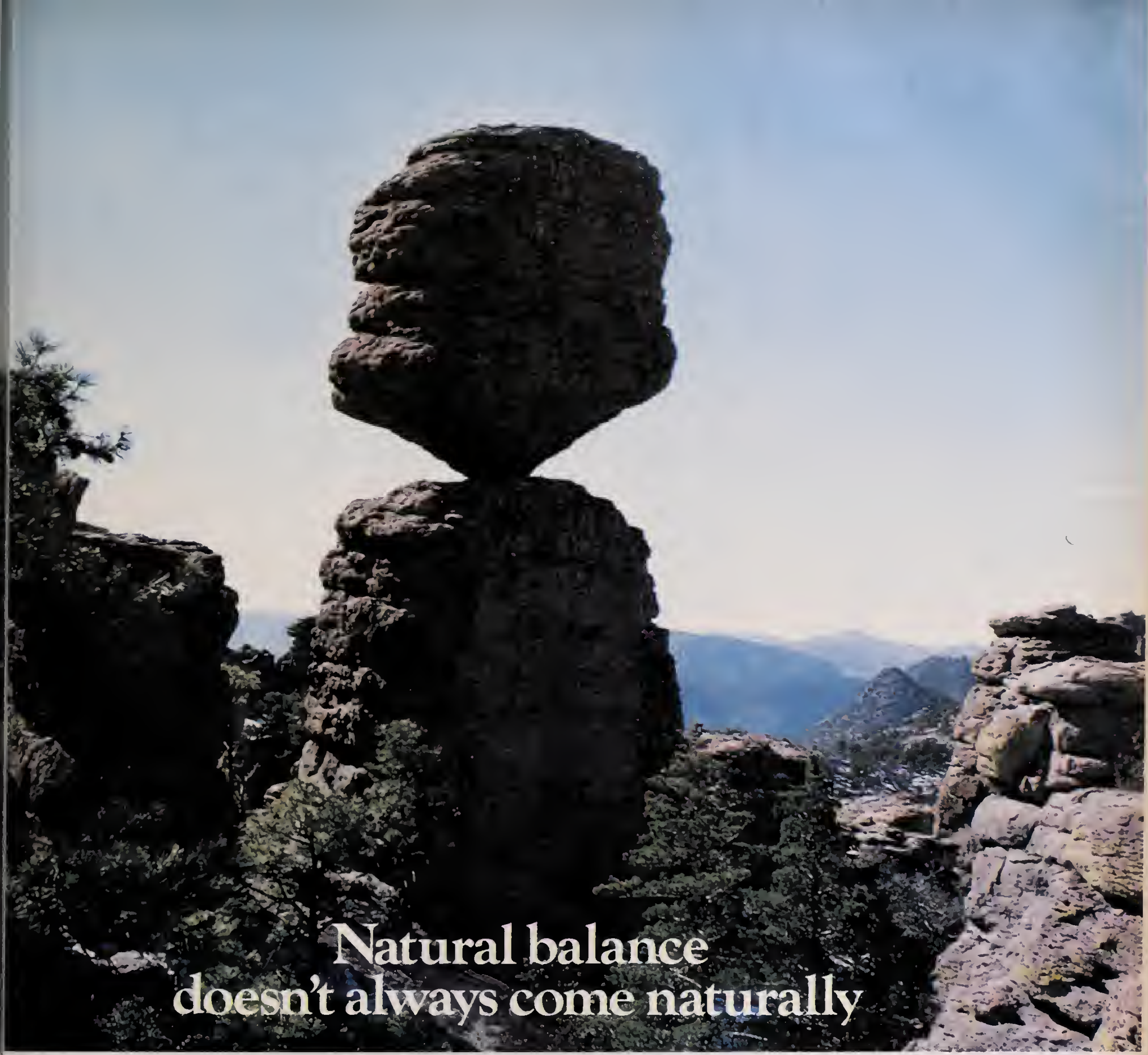
In order to prevent this condition all physicians using starch powdered gloves for any purpose, should thoroughly rinse the powder from the gloves prior to their ministrations. It is especially important in our modern, malpractice-minded milieu. In the operating room, a special powder basin separate from the usual ‘‘splash basin’’ should be kept throughout the course of the operation so that any gloves replaced during the operation can be thoroughly rinsed.

Some 20 years ago when talc granulomas became known, Doctor Richard Varco at the University of Minnesota devised a wet method for donning unpowdered gloves. After the surgical scrub, the surgeon rinsed his hands in alcohol, and then slipped his wet hands into the unpowdered gloves. This procedure was abandoned when starch powdered gloves became available. Perhaps today the procedure should be revived using some of the more potent bactericidal agents, such as Betadine, for the final rinse. This would have the added advantage of leaving a bactericidal film on the skin which would destroy the bacteria of the deeper layers of the skin that are not removed with the initial scrub and which migrate to the surface of the skin with perspiration during the course of an operation.

Surgical glove manufacturers are aware of the problem and are currently seeking a less harmful substance than starch. Until such a substance is found, starch on rubber medical surgical gloves should be meticulously removed.

References

1 Aarons, J and Fitzgerald, N: The Persisting Hazard of Surgical Glove Powder. Surg. Gyn. Ob. 385:138, 1974
2 Antopol, W: Lycopodium Granuloma. Arch Path, 326:16, 1933
3 Bates, B: Granulomatous Peritonitis. Ann Int Med. 1202:64, 1965
4 Coder, DM and Olander, GA: Granulomatous Peritonitis Caused by Starch Glove Powder. Arch Surg. 105:83, 1972
5 Eisman, B, Seelig, MG, and Womack, N: Talcum Powder Granuloma. Ann Surg. 820:126, 1947.
6. Lee, CM, Collins, WT, and Largen, TL: A Re-Appraisal of Absorbable Glove Powder. Surg Gyn and Ob 725:95, 1952.
7. Holgate, ST, Wheeler, JH, and Bliss, BP: Starch Peritonitis, and Immunological Study. Ann Roy Coll Surg, 52:182, 1973.



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Final classification of the less than effective indications requires further vestigation

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WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

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Usage in Pregnancy: See "Contraindications."

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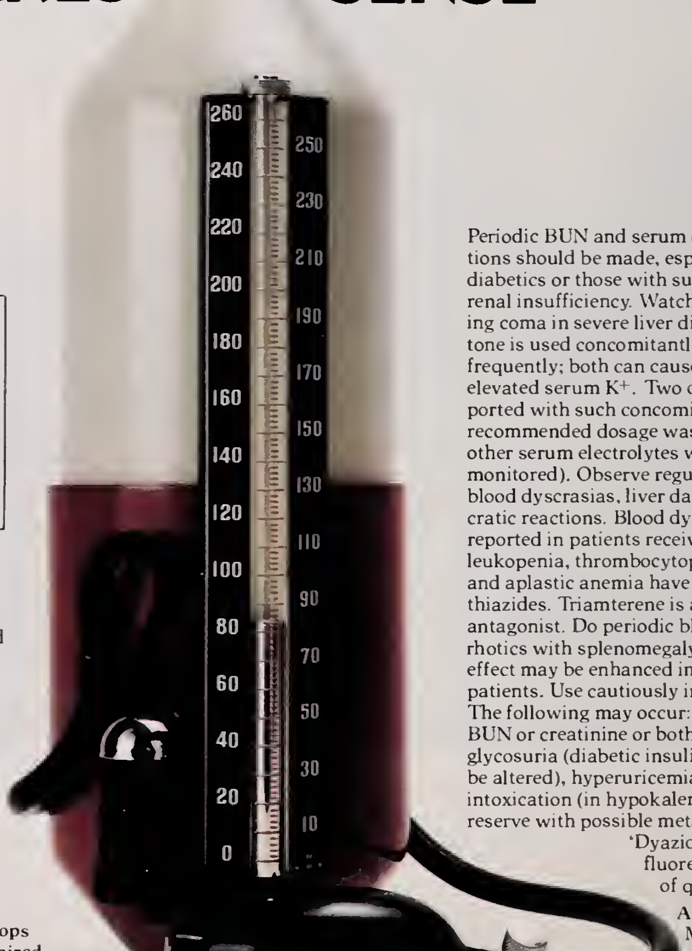

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* **Indications:** When the combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium sparing action of triamterene is warranted. (See Box Warning.) Routine use of diuretics in healthy pregnant women is inappropriate; they are indicated in pregnancy only when edema is due to pathological causes.

Contraindications: Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

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Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K$^+$ frequently; both can cause K$^+$ retention and elevated serum K$^+$. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis.

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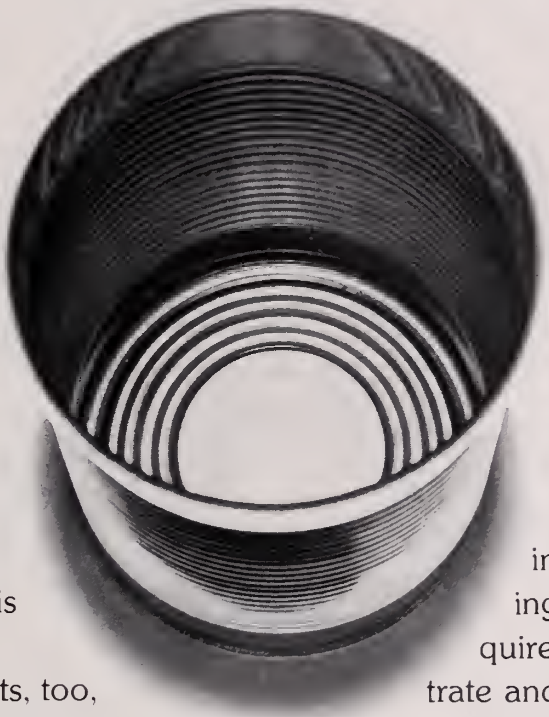

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Editorials

Giardiasis in Minnesota

AN INCREASING NUMBER of articles have directed our attention to the high incidence of recognized cases of giardiasis in the United States. The well-publicized epidemics in Aspen, Colorado, in 1965-1966 and in Leningrad in 1974 have led to increasing awareness of this parasite in our traveling public.

Weiss and associates in their article, "Giardiasis in Minnesota — 1971-1975",* confirm this increased incidence of giardiasis in Minnesota, in great part implicated to foreign travel. Of special interest to us is the 40% of patients with no travel outside of Minnesota during the two months before the onset of symptoms. Possibilities of contaminated or untreated water or direct fecal-oral transmission from humans or pets are mentioned.

The need for followup examinations following treatment is emphasized by a 16% treatment failure. This failure rate is higher than the 5-10% rates mentioned in the literature and suggests re-infection.

This report by Weiss and Associates leaves a number of questions unanswered. It helps us to maintain a healthy respect for the possible presence of *Giardia Lamblia* and to include it in the differential diagnosis of diarrhea, malabsorption, and persistent bowel upsets. At the same time it reminds us, physicians in private practice, of the valuable service the State Laboratory can provide us.

Jan H. Tanghe, M.D.
Minneapolis, Minnesota

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*See page 815.

Safe Prophylactic Perioperative Use of Anticoagulants

DR. MOLINA* HAS presented a well documented report on 292 patients treated prophylactically with Heparin and low molecular weight dextran in an attempt to prevent deep venous thrombosis and subsequent pulmonary emboli. He described no wound complications from the anticoagulants and only two proven cases of pulmonary emboli.

It is hard to imagine no wound complications occurring in 292 major cases if a significant anticoagulation level of Heparin and Dextran were achieved. Perhaps the lack of elevation of PTT would suggest that this was not achieved, and the fact that two pulmonary emboli did occur.

At the present time the risk of giving anticoagulants in significant amounts to prevent pulmonary emboli in soft tissue surgery is generally considered too great for their routine use. They probably should be used in the high risk patient—but then very carefully.

Harrison H. Farley, M.D.
Minneapolis, Minnesota

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*Molina, J.E.: Safe Prophylactic Perioperative Use of Anticoagulants, Minnesota Med 60:10:723, 1977.

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Tuberculin Testing

THE STUDY BY Franzen and DeRemee about the Tuberculin Skin Test, reported in this issue,* demonstrates once more that not all that is old cannot be improved. The authors show, although on a relatively small number of patients, that the tuberculin skin test can be interpreted with fair accuracy already 24 hours after its application. Previous recommendations varied between 48 and 72 hours, so this potentially saves a day and is of importance considering the cost and inconvenience, be it for hospitalized patients or outpatients.

As tuberculosis is still a world-wide problem, killing approximately three million people each year, early recognition and field studies still play a big role. The tuberculin skin test is pivotal in this and should help us to "keep the disease under control".[1]

Claus A. Pierach, M.D.
Minneapolis, Minnesota

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*See page 793.

Reference

1. Freedman SO: Tuberculin Testing and Screening; A Critical Evaluation. Hospital Practice 7:63, 1972

Arthrogryposis and Infantile Hypercalcemia Syndrome

SATRAN AND FISCH in the September issue* reported the occurrence of the infantile hypercalcemia syndrome in one boy and observed arthrogryposis multiplex congenita in his sister. It would be tempting to consider this association to be more than a chance one. Studies of patients with the hypercalcemia syndrome or patients with the syndrome complex often called "arthrogryposis multiplex congenita" have failed to show any other family having similar associations.

The observation may be explained on the basis of what is often called "Berkson's folly." Dr. Berkson, an eminent biostatistician and an emeritus member of the Mayo Clinic Staff, pointed out years ago that any major medical institution may find associations of diseases in the same patients or in other members of the family because they keep good records, examine patients carefully, and can diagnose rare conditions. Unless there are more cases of association of these two syndrome complexes, a causal relationship is doubtful. Nevertheless, these observations should be reported even if one considers that arthrogryposis multiplex congenita is not an entity but a combination of symptoms and signs due to decreased mobility in utero, to various causes such as muscular or neurologic abnormalities, or to any other problem causing in utero restriction of movements.

Gunnar B. Stickler, M.D.†
Rochester, Minnesota

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*Satran, Leon and Fisch, Robert O.: Arthrogryposis and Infantile Hypercalcemia Syndrome in Siblings. Minnesota Med 60:9:640; 1977.

†Mayo Clinic and Mayo Foundation.

Pneumatosis Cystoides Intestinalis in Childhood Systemic Lupus Erythematosus

THE CASE REPORT by Binstadt & L'Heureux on the association of Pneumatosis Cystoides Intestinalis (P.C.I.) and Systemic Lupus Erythematosus (S.L.E.)* adds another example to the growing list of causes of P.C.I. This condition is much more common in the adult and is most often seen in patients with respiratory or pyloroduodenal disease. Pediatricians are familiar with this entity as it is present in varying degrees in a significant percentage of sick premature infants who develop Nec-

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*Binstadt, D. H. and L'Heureux, P. R.: Pneumatosis Cystoides Intestinalis. Minnesota Med 60:6:408, 1977.

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rotizing Enterocolitis (N.E.C.). As is stressed in the case report the prognosis need not be grave. However a search for its etiology and careful clinical and radiologic monitoring for complications are important.

Although numerous theories have been proposed to explain the development of P.C.I., no single theory explains the clinical and pathologic findings noted in both infants and adults. In infants with N.E.C. selective intestinal ischemia may be the predisposing event setting the stage for invasion of the intestinal wall by gas producing bacteria giving rise to P.C.I. In the case of Binstadt and L'Heureux although no vascular lesions were seen at post mortem it is likely that the small blood vessels were involved in this patient with severe S.L.E. Although known bacterial pathogens have rarely been isolated in patients with P.C.I. the role of intestinal bacteria has not been extensively investigated. Studies of the intestinal flora especially the gas producing anaerobes may help to shed some light on this unusual disorder.

Mitchell J. Einzig, M.D.
Wayzata, Minnesota

Rupture of the Extensor Hallucis Longus Tendon

IT STANDS to reason that rupture of the extensor hallucis longus could happen by attrition, the same as a rupture of the extensor pollicis longus following a fracture of the wrist in which the extensor tendon of the thumb glides over Lister's tubercle. Here, instead of Lister's tubercle, is the vamp of the boot which produces pressure against the great toe tendon, and eventually there is enough wear that the tendon ruptures from attrition.

Fortunately, repair of the extensor hallucis longus as a rule gives a good result, with either perfect or near-perfect motion in the toe.

It would seem that a repair of the tendon should be carried out at any time, and if it would be impossible to bring the ends together then the use of a tendon graft might be necessary.

Harry B. Hall, M.D.
Edina, Minnesota

See page 789.

Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

The Editors

COVER PHOTO

"Starch Crystals"

The series of photographs of Starch Crystals were taken by Dr. John A. Hetzler, a pathologist at the Fairview Hospital in Minneapolis. He shot the crystals using a polarized light through a microscope 100× and 500×. The film used was the Etchrome 64, ER film.

The bottom two photographs wers shot at 500 × from the same field with the polarizer rotated at 90° to show the birefringent color change of the crystals. (Note the change of the color in the crystals by the 90 degree rotation.) The top photo was shot at 100 × and shows the starch crystals in a giant cell.

Dr. Hetzler is a graduate of the University of Minnesota Medical School and a resident of the Veteran's Hospital in Minneapolis. He is an enthusiastic photographer but spends much of his leisure moments sailing or skiing.

Case Report

Ruptured Spleen, Placental Abruption and Toxemia of Pregnancy

Simultaneous Complications of Pregnancy

JOHN J. GRAHAM, M.D.[*]

A case of splenic rupture in conjunction with abruptio placenta and toxemia of pregnancy is reported. Various etiologic factors are reviewed with special reference to the role played by toxemia of pregnancy. The diagnosis, treatment and prognosis of splenic rupture in pregnancy are also considered.

While precise incidence of splenic rupture in association with pregnancy is not known, it would appear to be a rare but definite complication of pregnancy. A case occurred recently in our practice, and that case forms the basis of the following report.

THE PATIENT, a twenty-seven-year-old white female, gravidal I, was admitted to the hospital the afternoon of the eleventh of December at thirty-seven weeks gestation. Her prenatal course had been uneventful until the date of admission. A routine prenatal visit on that date revealed an eight pound weight gain in two weeks, a blood pressure of 170/100 and a 3+ proteinuria.

Physical examination on admission to the hospital revealed a blood pressure of 175/100, 3+ pitting edema and obvious hyper-reflexia. The uterus was enlarged at 36 cms. above the symphysis pubes, with fetal heart tones at 140 in the right lower quadrant. No abdominal rigidity or uterine irritability was noted, and the patient had no complaints of abdominal pain.

On admission, she was given an intramuscular dose of 10 Gms. of Magnesium Sulfate, initially, and 5 Gms. q.4.h. and an infusion of 20 mgm. Apresoline in 500 cc's 5% D/W was started which maintained the blood pressure at 140/90.

On the morning of the twelfth of December, the membranes ruptured spontaneously, and grossly bloody amniotic fluid was noted. Internal fetal monitoring was immediately started, and persistent fetal bradycardia at 100 beats was noted.

Uterine tenderness and irritability were noted at that time, and it was decided that delivery should be affected by Cesarean section: the preoperative diagnosis being abruptio placenta. The abdomen was entered through a midline incision and upon entering the abdomen, it was apparent that a moderate amount of clotted blood was free in the abdominal cavity. A low transverse cervical incision was made, and a premature infant was delivered. It was apparent that at least one-quarter of the maternal surface of the placenta had already separated. The uterine defect was repaired in routine fashion, and there appeared to be good uterine hemostasis.

The abdominal cavity, however, appeared to contain an inordinate amount of clotted and semi-clotted blood. There was a secondary site of hemorrhage which was localized to the left upper quadrant. The spleen was visualized and appeared to be the site of hemorrhage. A splenectomy was carried out, and examination of the dorsal aspect of the spleen revealed a 3 cm. rent in the splenic capsule. The pathology report on the surgical specimen was that of "spleen free of intrinsic disease, consistent with trauma". The patient's postoperative course was essentially uneventful. Her platelet count remained within the limits of normal, and she was discharged from the hospital on the twelfth post operative day. She has resumed normal menstruation and is in good health at the time of this report.

Discussion

Rupture of the spleen in pregnancy remains a rare complication. The first case was reported by Saxtorph[1] in 1803, and it is of interest to note that the first nine reported cases in the literature were all diagnosed at the time of autopsy. The first splenectomy for the condition was performed by Savore[2] in 1898, and this patient survived and was later delivered of a full term infant. In 1958, Sparkman[3] brought the literature up to date and added two cases of his own, bringing the number of cases reported to forty-four. Undoubtedly, more cases occur than are reported, but it remains a relatively rare complication.

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[*] Department of Obstetrics and Gynecology at Fairview-Southdale Hospital, Minneapolis, Minnesota

Splenic rupture occurs either secondary to trauma or in the presence of intrinsic splenic disease. A certain percentage of cases occur in which neither of these factors appear to be present and under those circumstances, the etiology is considered to be spontaneous. The spleen is the commonest single visceral organ which ruptures as a result of trauma. This reflects the soft mobile nature of the organ, its tendency to enlarge and become pulpy, and its location in the upper abdomen which exposes it to possible trauma.

The influence of pregnancy on the spleen is debated. Enlargement and congestion are said to occur, but this is open to some question. Barcroft and Stevens[4] demonstrated that the exteriorized spleen of pregnant dogs actually decrease in size, reaching its smallest size a few days before term.

Trauma may take the form of some obvious penetrating injury or, as suggested by Barnett[5], may take the form of some minor insult such as a severe bout of coughing, vomiting, coitus toward the end of pregnancy or the bearing down efforts of the second stage of labor. McIndoe[6] showed that a significant latent period may exist between the initial insult and the onset of obvious symptoms. This interval may vary from several hours up to several days.

Numerous medical conditions render the spleen more libel to rupture. Among these: malaria[7], infectious mononucleosis[8], sub-acute bacterial endocarditis[9], typhoid fever[10], typhus fever[11], relapsing fever[11], sepsis[12], infectious hepatitis[13], influenza[14], Banti's Syndrome[8], tuberculosis[15], syphilis[15], sarcoidosis[16], leukemia[17], torsion[18], hemangioma[19], hydatid disease[20], and amyloid disease[15] have all been incriminated. Spontaneous rupture of the spleen is a debatable surgical issue. Many authors doubt that this condition really exists and suggest that in all of these cases the rupture was due to some forgotten or unrecognized episode of trauma.

The etiologic role which toxemia might play in this condition also remains somewhat unclear. There are, however, certain well defined pathological entities which occur in connection with toxemia which would seem to indite this as a possible cause.

Rupture of the liver has been reported in conjunction with eclampsia[20]. In these cases, obvious hepatic necrosis had occurred. Other pathologic changes, associated with toxemia and which might contribute to visceral rupture, include hypertension and deciminated intravascular coagulation. An inordinately large uterus, which is sometimes associated with toxemia, might also significantly disturb the normal position of the spleen, especially if the splenic pedicle is short.

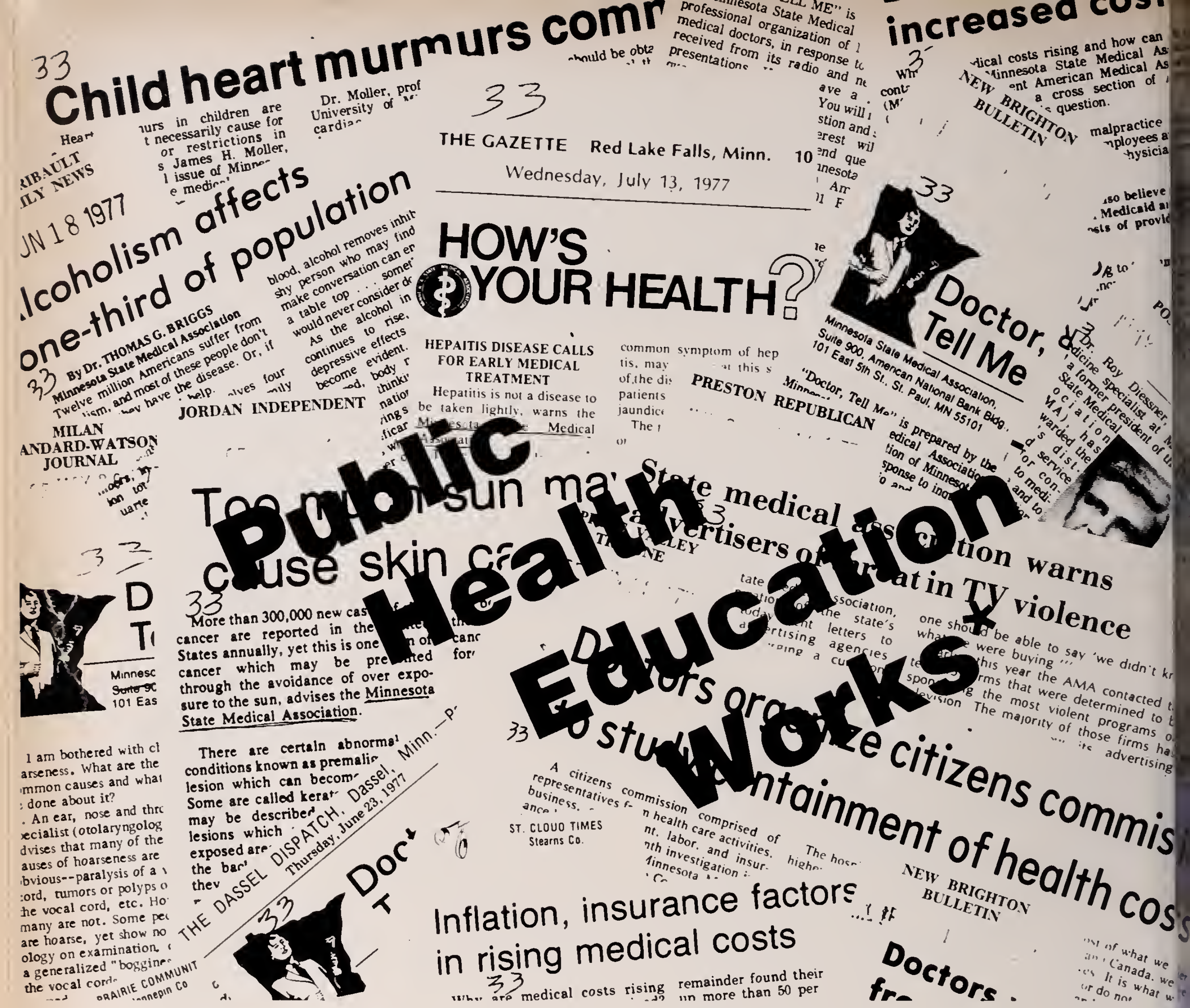
In pregnancy, this complication is seen most commonly in multiparous females in the third trimester. Evidence of severe intra-abdominal hemorrhage may be the only sign on which to base a diagnosis. Abdominal pain with radiation of pain to the left shoulder is frequently, but not always, present. The co-existence of a pregnancy with this condition only serves to make the diagnosis more difficult. In the first trimester, it is often mistaken for ruptured ectopic pregnancy and in the last trimester, abruptio placenta or rupture of the uterus may seem the more obvious diagnosis. In only six of the forty-four cases reported by Sparkman[3] was the condition even considered, preoperatively.

There is only one treatment for this condition, and that is surgical. Splenectomy, with or without Cesarean section, will be life-saving. If the pregnancy is at or near term, a Cesarean section might be necessary simply to allow adequate exposure of the spleen for easier surgical removal. In the case of significant prematurity, however, the fetus may be allowed to remain inutero in spite of the splenectomy, and the pregnancy allowed to continue to term with vaginal delivery anticipated. Platelet counts vary considerably following splenectomy and markedly increased counts with associated intravascular thrombosis or significant thrombocytemia have both been observed. Platelet counts must be closely monitored in the postoperative period. Given modern surgical and blood banking techniques, the prognosis for both mother and infant should be excellent, and a good outcome should be anticipated.

References

1. Saxtorph: Quoted by Kotschnew, MS and Manenkow, PW. Centralbl Gynak 54:3106, 1930.
2. Savore, R: Fall von Milzexstirpation Wahrend der Schwanger -Shaft Wegen: Traumatischer Suptur Centralbl Gynak 48:1306, 1898.
3. Sparkman, R: Rupture of the Spleen in Pregnancy, Am J Obstet Gynecol 76:587, 1958
4. Barcroft, J, Stevens, JG: The Effect of Pregnancy and Menstruation on the Size of the Spleen, J Physiol 66:32, 1928.
5. Barnett, T: Rupture of the Spleen in Pregnancy, J Obstet Gynecol Br Emp 59:789, 1952.
6. McIndoe, A: Delayed Haemorrhage Following Traumatic Rupture of the Spleen, Br J Surg 20:249, 1932
7. Hershey, FB, Lubitz, JM. Spontaneous Rupture of the Malarial Spleen, Ann Surg 127:40, 1948.
8. Smith, EB, Custer, RP Rupture of the spleen in Infectious Mononucleosis, Blood I: 317, 1946.

9-21-Will be found on page 790.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Adult Hypercholesterolemic	1.0-2.0 mg.	1.0-2.0 mg.	4.0-8.0 mg.	4.0-8.0 mg.
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Description
CHOLOXIN (sodium dextrothyroxine) is the sodium salt of the dextrorotatory isomer of thyroxine. It is chemically described as D-3,5,3′,5′-tetraiodothyronine sodium salt.

Actions
The predominant effect of CHOLOXIN (sodium dextrothyroxine) is the reduction of serum cholesterol levels in hyperlipidemic patients. Beta lipoprotein and triglyceride fractions may also be reduced from previously elevated levels.

Most of the available evidence indicates that CHOLOXIN (sodium dextrothyroxine) stimulates the liver to increase catabolism and excretion of cholesterol and its degradation products via the biliary route into the feces. Cholesterol synthesis is not inhibited and abnormal metabolic end-products do not accumulate in the blood.

Indications
This is not an innocuous drug. Strict attention should be paid to the indications and contraindications.
CHOLOXIN (sodium dextrothyroxine) is an antilipidemic agent used as an adjunct to diet and other measures for the reduction of elevated serum cholesterol (low density lipoproteins) in euthyroid patients with no known evidence of organic heart disease.
The drug is also indicated in the treatment of hypothyroidism in patients with cardiac disease who cannot tolerate other types of thyroid medication.
Before prescribing, note the following: Results from a randomized clinical study have indicated a possible adverse effect when CHOLOXIN (sodium dextrothyroxine) is administered to a patient receiving a digitalis preparation. There may be an additive effect. This additive effect may possibly stimulate the myocardium excessively, in patients with significant myocardial impairment. CHOLOXIN (sodium dextrothyroxine) dosage should not exceed 4 mg per day when the patient is receiving a digitalis preparation concomitantly. Careful monitoring of the total effect of both drugs is important.
It has not been established whether the drug-induced lowering of serum cholesterol or lipid levels has a detrimental, beneficial, or no effect on the morbidity or mortality due to atherosclerosis or coronary heart disease. Several years will be required before current investigations will yield an answer to this question.

Contraindications
The administration of CHOLOXIN (sodium dextrothyroxine) to euthyroid patients with one or more of the following conditions is contraindicated:

1. Known organic heart disease, including angina pectoris; history of myocardial infarction; cardiac arrhythmia or tachycardia, either active or in patients with demonstrated propensity for arrhythmias; rheumatic heart disease; history of congestive heart failure; and decompensated or borderline compensated cardiac status.
2. Hypertensive states (other than mild, labile systolic hypertension).
3. Advanced liver or kidney disease.
4. Pregnancy.
5. Nursing mothers.
6. History of iodism.

Warnings
CHOLOXIN (sodium dextrothyroxine) may potentiate the effects of anticoagulants on prothrombin time. Reductions of anticoagulant dosage by as much as 30% have been required in some patients. Consequently, the dosage of anticoagulants should be reduced by one-third upon initiation of CHOLOXIN therapy and the dosage subsequently readjusted on the basis of prothrombin time. The prothrombin time of patients receiving anticoagulant therapy concomitantly with CHOLOXIN therapy should be observed as frequently as necessary, but at least weekly, during the first few weeks of treatment.

In the surgical patient, it is wise to consider withdrawal of the drug two weeks prior to surgery if the use of anticoagulants during surgery is contemplated.

When CHOLOXIN (sodium dextrothyroxine) is used as thyroid replacement therapy in hypothyroid patients with concomitant coronary artery disease (especially those with a history of angina pectoris or myocardial infarction) or other cardiac disease, treatment should be initiated with care. Special consideration of the dosage schedule of CHOLOXIN (sodium dextrothyroxine) is required. This drug may increase the oxygen requirements of the myocardium, especially at high dosage levels. Treated subjects with coronary artery disease must be seen at frequent intervals. If aggravation of angina or increased myocardial ischemia, cardiac failure, or clinically significant arrhythmia develops during the treatment of hypothyroid patients, the dosage should be reduced or the drug discontinued.

Special consideration must be given to the dosage of other thyroid medications used concomitantly with CHOLOXIN (sodium dextrothyroxine). As with all thyroactive drugs, hypothyroid patients are more sensitive to a given dose of CHOLOXIN (sodium dextrothyroxine) than euthyroid patients.

Epinephrine injection in patients with coronary artery disease may precipitate an episode of coronary insufficiency. This condition may be enhanced in patients receiving thyroid analogues. These phenomena should be kept in mind when catecholamine injections are required in sodium dextrothyroxine-treated patients with coronary artery disease.

Since the possibility of precipitating cardiac arrhythmias during surgery may be greater in patients treated with thyroid hormones, it may be wise to discontinue CHOLOXIN (sodium dextrothyroxine) in euthyroid patients at least two weeks prior to an elective operation. During emergency surgery in euthyroid patients, and in surgery in hypothyroid patients in whom it may not be advisable or possible to withdraw therapy, the patients should be carefully observed.

There are reports that sodium dextrothyroxine in diabetic patients is capable of increasing blood sugar levels with a resultant increase in requirements of insulin or oral hypoglycemic agents. Special attention should be paid to parameters necessary for good control of the diabetic state in dextrothyroxine-treated subjects and to dosage requirements of insulin or other antidiabetic drugs. If sodium dextrothyroxine is later withdrawn from patients who had required an increase of insulin (or oral hypoglycemic agents) dosage during its administration, the dosage of antidiabetic drugs should be reduced and adjusted to maintain good control of the diabetic state.

When either or both impaired liver or kidney function are present, the advantages of CHOLOXIN (sodium dextrothyroxine) therapy must be weighed against the possibility of deleterious results.

Usage in Women of Childbearing Age
Women of childbearing age with familial hypercholesterolemia or hyperlipemia should not be deprived of the use of this drug; it can be given to those patients exercising strict birth control procedures. Since pregnancy may occur despite the use of birth control procedures, administration of CHOLOXIN (sodium dextrothyroxine) to women of this age group should be undertaken only after weighing the possible risk to the fetus against the possible benefits to the mother. Teratogenic studies in two animal species have resulted in no abnormalities in the offspring.

Precautions
It is expected that patients on dextrothyroxine therapy will show greatly increased serum protein-bound-iodine levels. These increased serum PBI values are evidence of absorption and transport of the drug, and should NOT be interpreted as evidence of hypermetabolism; similarly, they may not be used for titrating the effective dose of CHOLOXIN (sodium dextrothyroxine). PBI values in the range of 10 to 25 mcg% in treated patients are common.

If signs or symptoms of iodism develop during CHOLOXIN (sodium dextrothyroxine) therapy, the drug should be discontinued.

A few children with familial hypercholesterolemia have been treated with CHOLOXIN for periods of one year or longer with no adverse effects on growth. However, it is recommended that the drug be continued in patients in this age group only if a significant serum cholesterol-lowering effect is observed.

Adverse Reactions
The side effects attributed to dextrothyroxine therapy are, for the most part, due to increased metabolism, and may be minimized by following the recommended dosage schedule. Adverse effects are least commonly seen in euthyroid patients with no signs or symptoms of organic heart disease; the incidence of adverse effects is increased in hypothyroid patients, and is highest in those patients with organic heart disease superimposed on the hypothyroid state.

In the absence of known organic heart disease, some cardiac changes may be precipitated during sodium dextrothyroxine therapy. In addition to angina pectoris, arrhythmia consisting of extrasystoles, ectopic beats, or supraventricular tachycardia, ECG evidence of ischemic myocardial changes and increase in heart size have been observed. Myocardial infarctions, both fatal and non-fatal, have occurred, but these are not unexpected in untreated patients in the age groups studied. It is not known whether any of these infarcts were drug related.

Changes in clinical status that may be related to the metabolic action of the drug include the development of insomnia, nervousness, palpitations, tremors, loss of weight, lid lag, sweating, flushing, hyperthermia, hair loss, diuresis, and menstrual irregularities. Gastrointestinal complaints during therapy have included dyspepsia, nausea and vomiting, constipation, diarrhea, and decrease in appetite.

Other side effects reported to be associated with CHOLOXIN (sodium dextrothyroxine) therapy include the development of headache, changes in libido (increase or decrease), hoarseness, tinnitus, dizziness, peripheral edema, malaise, tiredness, visual disturbances, psychic changes, paresthesia, muscle pain, and various bizarre subjective complaints. Skin rashes, including a few which appeared to be due to iodism, and itching have been attributed to dextrothyroxine by some investigators. Gallstones have been discovered in occasional dextrothyroxine-treated patients and cholestatic jaundice has occurred in one patient, although its relationship to CHOLOXIN therapy was not established.

In several instances, the previously existing conditions of the patient appeared to continue or progress during the administration of CHOLOXIN (sodium dextrothyroxine); a worsening of peripheral vascular disease, sensorium, exophthalmos, and retinopathy have been reported.

CHOLOXIN (sodium dextrothyroxine) potentiates the effects of anticoagulants, such as warfarin or Dicumarol, on prothrombin time, thus indicating a decrease in the dosage requirements of the anticoagulants. On the other hand, dosage requirements of antidiabetic drugs have been reported to be increased during dextrothyroxine therapy (see WARNINGS section).

Dosage and Administration
For **adult** euthyroid hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is 4 to 8 mg per day. The initial daily dose should be 1 to 2 mg to be increased in 1 to 2 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, if that dosage level is indicated to effect the desired lowering of serum cholesterol.

When used as partial or complete substitution therapy for levothyroxine in hypothyroid patients with cardiac disease who cannot tolerate other types of thyroid medication, the initial daily dose should be 1 mg to be increased in 1 mg increments at intervals of not less than one month to a maximum level of 4 to 8 mg daily, preferably the lower dosage. The maximum in patients receiving digitalis therapy is 4 mg.

For **pediatric** hypercholesterolemic patients, the recommended maintenance dose of CHOLOXIN (sodium dextrothyroxine) is approximately 0.1 mg (100 mcg) per kilogram. The initial daily dosage should be approximately 0.05 mg (50 mcg) per kilogram to be increased in up to 0.05 mg (50 mcg) per kilogram increments at monthly intervals. The recommended maximal dose is 4 mg daily, if that dosage is indicated to effect the desired lowering of serum cholesterol.

If new signs or symptoms of cardiac disease develop during the treatment period, the drug should be withdrawn.

How Supplied
CHOLOXIN (sodium dextrothyroxine) is supplied in prescription packages of scored 1, 2, 4, and 6 mg tablets.

FLINT LABORATORIES
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Deerfield, Illinois 60015

Letters to the Editor

Psychologic Giving Up: An Often Fatal Choice

Dear Editor:

Psychologic giving up is well recognized by the laity as a precipitating cause of illness and death; its occurrence is rarely discussed in medical circles and literature. Five months followed an unplanned retirement, a healthy older physician was beset by bronchitis, and unexpected complications and death. The following brief case report affords an example of the giving up complex with the associated feelings of hopelessness and helplessness.

A 71-year-old physician took ill with fever and chills two days, chest discomfort one week, and increasing cough four weeks duration: A course of erythromycin gave no improvement. An identical illness four years previously resulted in slow recovery. A stable apical infiltrate followed pulmonary tuberculosis 40 years ago. Examination on admission revealed an elderly dyspneic man, temperature 100.0(F), pulse 100 with bilateral wheezes. Bronchitis progressed to a left lower lobe infiltrate. Bronchopneumonia was diagnosed but recurrent pulmonary emboli were suspected. Anticoagulation was instituted; retroperitoneal hemorrhage ensued. Renal failure complicated the course. He repeatedly denied the gravity of his illness. At the onset of the initial complications he refused consultation and several treatment modalities; for example, he turned off the oxygen repeatedly against advice. An inferior vena caval umbrella was inserted; a retroperitoneal hematoma was surgically evacuated. Dialysis was advised when renal failure progressed. He refused this advice. Death occurred on the 16th hospital day. Autopsy revealed massive left retroperitoneal hemorrhage and bilateral purulent bronchopneumonia, lower lobes.

This puzzling case of a vigorous man with no organic basis for lowered resistance succumbing to bronchitis led me to inquire into the psychosocial history. He had neglected to have a physical examination for many years and a chest Xray for six years. Two years prior to his death he received a preobituary notice in the mail. He was described as extremely upset by this notice, stating vehemently that he had no plans for retirement. Reversing himself and stating he was extremely fatigued by a large practice, he retired suddenly five months prior to his death. His son described him as very upset and unsettled since the retirement.

I hypothesize that he was in a vulnerable psychologic state; that retirement inadequately planned, tilted the balance to lethal outcome from a mild infection: His case could be an example of a giving up complex with associated helplessness or hopelessness feelings.

A 25 years study of the psychosocial setting of the onset of medical illnesses reveals that life events followed by feelings of loss for which there is no perceived solution is a common pattern antecedent to organic disease.

Greene showed a relation of psychologic factors to onset of leukemia and lymphoma.[1] In 1955 Engel reported that ulcerative colitis occurred with effects of helplessness, hopelessness and despair.[2] The psychologic giving up complex was described by Schmale and Engel[3,4] during the period 1958 and onward. For example, study of 42 hospitalized medical patients, unselected as to diagnosis revealed that the experience of a loss antedated illness onset in a variety of diseases.

The theoretical model encompasses the idea that if an event is perceived as a loss and the individual is unable to overcome this loss, the person will experience feelings of helplessness — the patient ascribes the failures or deficiencies to his environment — or hopelessness — he ascribes the loss more to his own personal failures or inadequacies and to be irreparable. Such effects of giving up are believed to be associated with increased vulnerability to disease and are regarded as facilitating the onset of disease.[3,5] With regard to the psychophysiologic aspects of giving up, the effects of helplessness and/or hopelessness are regarded as indicative that the organism has given up on its fight or flight response to the threat. Bibring refers to helplessness as a basic ego response to danger diametrically opposite to anxiety — anxiety indicates a strong desire to survive; helplessness indicating a paralysis of the ego because the person is unable to overcome the danger.[6] There is growing evidence that various physiologic alterations may follow these paralyzing affects.[3]

The ultimate consequences of the giving up complex are of three types: (1) the person may develop new and more effective means of coping or external circumstances may change to his advantage, (2) he may become physically ill, (3) he may make use of psycho- or socio-pathological devices to resolve the complex in which case he may be regarded as psychiatrically ill or socially deviant.[4]

Evidence that unplanned retirement may lead to psychologic giving up and premature death is equivocal, one study indicating a 20 percent increased mortality in the first three years after retirement; another study showing no increase in mortality.[8]

Psychologic giving up and associated helplessness and hopelessness are exemplified by a case of retirement followed by early death. There is evidence that this complex is an important antecedent in the onset of many somatic and psychiatric disease states.

Earl Hill, M.D.
Minneapolis, Minnesota

References

1. Greene, WA, Jr. Psychological factors and reticuloendothelial disease. I. Preliminary observations on a group of males with lymphomas and leukemias. Psychosom Med 16:220, 1954
2. Engel, GL. Studies of ulcerative colitis III. The nature of the psychologic processes. Am J Med 19:231, 1955.
3. Adamson, John D. Schmale, Arthur H Jr. Object loss, giving up, and the onset of psychiatric disease. Psychosom Med 27:557, 1965
4. Schmale, Arthur H Jr, Engel, GL. The giving up — given up complex illustrated on film. Arch Gen Psych 17:135, 1967
5. Schmale, Arthur H. Jr, Iker, Howard P: The affect of hopelessness and the development of cancer. I. Identification of uterine cervical cancer in women with atypical histology. Psychosom Med 28:714, 1966
6. Bibring, E. The mechanism of depression in. Affective Disorders ed. P. Greenacre. New York, International Universities Press pg. 13 (1953).
7. Myers, Robert J. Factors in interpreting mortality after retirement. Amer Statist Assn J 49:499, 1954
8. Tyhurst, James S. Salk, Lee, Kennedy, M. Mortality, Morbidity and Retirement. Am J Public Health 47:1434, 1957

Living in the Style to Which One Is Accustomed

Dear Editor:

As the first year Carter Administration begins to guide our government, interest is once again rekindled in National Health Insurance. It appears a bill will not be passed during this session of Congress, but it is inevitable some sort of health care payment plan will be law in the near future.

The extent or thrust of NHI is unknown but the impact of it will be felt in the delivery of, and payment for, health care. Whether NHI takes the form of a Kennedy-Corman Bill, the Fulton Plan backed by the AMA, or a new proposal from President Jimmy Carter, one wonders if an additional effect will be to significantly increase our individual and collective "good health." Considering our nation's health in a realistic sense, it is important to determine what NHI can, as well as cannot, do for Americans.

The impetus for a health care plan comes from many individuals and groups in the United States. Understandably we disagree as to how these plans should be implemented. There is, however, much less argument as to the necessity of implementing some type of all-encompassing guarantee of access and benefit to all Americans. Reasons for the implementation include suboptimal morbidity and mortality as measured by various parameters of health statistics, climbing health care costs, general group and individual dissatisfaction with health care delivery, and the inadequacies of existing health care insurance plans to provide sufficient coverage for day-to-day and catastrophic events. That these are worthy goals is undeniable. However, the manner in which these can best be achieved, and what we can reasonably expect the results to be, is the medical-health question of the decade.

Considering the scope of these goals, one wonders of the probable success rate. Can a single doctor, and moreover, a single patient move toward these ends as an individual? To wit, what can be done to increase the likelihood that the optimal economic and sociomedical benefits for any far-reaching health plan will be achieved?

Narrowing our scope of the problem to just the morbidity/mortality question, and considering a few well known health statistics, we can see that indeed the individual does have a very large stake in this question both from the cause and effect nature of the proposition. Furthermore, if one examines health care statistics of morbidity/mortality and also looks at what we know of American life-style in general, striking patterns appear which have long been noted by epidemiologists.

The single largest cause of death in this country is heart disease. Whereas no one has all the answers to the ultimate cause of this group of diseases, many contributing factors are conspicuous in their relation to that thing we call "the American way of life". Obesity, though not established as an isolated cause of heart disease, is commonly associated with diseases such as hypertension and coronary artery disease. Americans maintain this obesity in spite of world wide famine, as well as social and medical admonition to the contrary.

Similarly, cigarette smoking is the most strongly established behavioral link to coronary artery disease. It is also emphatically linked to lung cancer by no less than the Surgeon General and represents a large portion of the deaths of America's number two killer, cancer. However, do these well known social and medical realities alter cigarette consumption? In fact, Americans overall have not only maintained their rate of cigarette smoking over the years but have actually increased the per capita consumption.

After a brief dip in cigarette smoking in the mid-60's following the Surgeon General's warning, the ranks are swelling with new smokers. The new smokers are the youths and women. Economically, cigarette companies have fared well during our economic turndown. That is, in spite of belt-tightening, Americans can still find the ready cash in their slim budgets for a carton of cigarettes.

Surveying other causes of death which are prominent in this country, cirrhosis, the irreversible atrophy of the liver, ranks high. A large portion of these deaths can be attributed to behavioral linked problems such as alcoholism and hepititis. A significant portion of this latter disease is directly and indirectly related to drug usage and contaminated blood transfusions from those previously contacting the disease.

Other members of the top ten causes of death among adults in the United States include accidental death, suicide, and homicide. Regarding the former, recently noted has been the decrease in automobile deaths coinciding with the mandated 55 mph speed limit, and its resultant increase as controls are slackening. In addition, suicide and homicide are by definition attributed to human failing and not frequently associated with medically treatable disease in its strictest sense. Again, these causes point to individual or group behavior which continues to reflect the peculiar foibles and fancies of being an American.

On the threshold of being included in a NHI plan, where do we as Americans find ourselves, and where are we going, in terms of health? Attempting to answer questions with many unknown variables is difficult and my foresight is certainly less gifted than those who are considered experts on these questions. Although NHI may solve many of the problems of finance and health care delivery, we cannot reasonably expect it to dramatically decrease those diseases which we bring onto ourselves. At this point, the proverbial Big Brother of a mandatory health care blanket can only do so much to help us realize that elusive health and well-being goal.

Richard L. Ecker, M.D.,
Rochester, Minnesota

MSMA Meetings

We gather together . . .

Our heritage in Minnesota provides the medical community a high standard to maintain. It requires a conscious effort from each of us.

Scientific, business, and political concerns all take their place of importance today as we become increasingly aware that practicing medicine just isn't what it used to be. Keeping current in all of these areas has become necessary for professional survival. The day-to-day practice of medicine requires constant communication and sharing of knowledge between colleagues.

Meetings have been held year after year, and there are those who view them as unnecessary. But what better way to communicate? The Minnesota State Medical Association provides a forum for Minnesota physicians to exchange ideas and opinions, share their knowledge, and become familiar with the medical environment in which they practice. To us that seems important.

Duluth will host the 1978 Annual Meeting of the Association May 11-12. At that meeting business and politics combine with a major scientific effort in continuing medical education. A wide variety of topics in clinical medicine comprises the 1978 program, planned with specialty societies lending their support to the MSMA Subcommittee on Scientific Assembly. These accredited courses are designed to meet the practical educational needs of Minnesota doctors. The Subcommittee encourages physician attendance annually for good, convenient, and inexpensive continuing medical education.

The House of Delegates meets in May and November to conduct Association business and establish policy in behalf of all MSMA members. These policies represent the collective voice of Minnesota physicians wherever and whenever appropriate.

On November 18-19, 1977, the MSMA House of Delegates will meet at the Radisson South Hotel in Bloomington. These physician representatives invite their colleagues to communicate through local representatives or specialty societies the issues and concerns that should be considered by this policy-making body.

Both MSMA meetings in May and November are opportunities for communication and learning within the medical profession. They can be effective only with continued cooperation from physicians. We invite you to participate.

MSMA Annual Meeting
May 11-12, 1978
Duluth, Minnesota

MSMA House of Delegates
Interim Meeting
November 18-19, 1977
Radisson South Hotel
Bloomington, Minnesota

S. V. Thorson, M.D., Chairman
MSMA Subcommittee on Scientific Assembly

J. W. Halvorson, M.D., Speaker
MSMA House of Delegates

Minnesota Department of Health

Giardiasis in Minnesota, 1971-1975

HAROLD B. WEISS, M.S., M.P.H.*, DAVID A. WINEGAR, M.S.†,
BARRY S. LEVY, M.D.‡, and JOHN W. WASHBURN, B.A.#

In order to clarify the extent, trends, and some contributing factors of human *Giardia lamblia* infection in Minnesota, we reviewed state health department records and conducted two questionnaire surveys. Between 1971 and 1975, the state laboratory in Minnesota identified cysts of *G. lamblia* in the stools of 1,819 individuals. In 1975, it identified them more than seven times more frequently than in 1971. The reason for this increase is not clear. Seventy-one percent of the individuals who had cysts identified in 1975 indicated "recent foreign travel." Among a group of individuals without foreign travel, 46% had not been out of Minnesota in the two months before onset of symptoms, and 63% had consumed untreated water during this period. Among another group of individuals with *G. lamblia* infection, at least 16% had evidence of persistent infection despite having received the currently recommended treatments.

THE CAUSATIVE AGENT of giardiasis is the intestinal flagellate protozoan known as *Giardia lamblia*. Characteristic symptoms of giardiasis include: chronic diarrhea, weight loss, fatigue, flatulence, steatorrhea, B_{12} malabsorption, abdominal cramps, and growth retardation (in children). The incubation period extends from one to eight weeks.

It has long been known as the most commonly identified flagellate in the human intestinal tract, but its pathogenicity has not been fully recognized until the last few years.[1–3] *Giardia lamblia* is now perceived as responsible for inducing significant morbidity in large and localized epidemics, familial outbreaks, and in many individuals, most with recent foreign travel.

The diagnosis of giardiasis is usually made by identifying the characteristic cysts in a fresh or formalin preserved stool specimen by either a direct exam or a concentration method. Due to varying numbers of cysts expelled in the stools and possible cyclic timing of their release, at least three stool specimens should be examined; collected several days apart. If all three are negative, and giardiasis is still suspected, examination of duodenal aspirates and/or a small bowel biopsy can be performed and is usually more indicative[4]. An alternative approach has recently been suggested[5] of multiple fecal examinations (three a week for four to five weeks) examined by direct smear *and* concentration technique. Whichever method(s) is (are) used, the physician and epidemiologist must remember that, in some cases, patients with symptomatic giardiasis may excrete no *Giardia* at all and conversely, a patient may pass copious quantities of *Giardia* in his or her stool and be symptom-free[4]. Another diagnostic problem occurs when *Giardia* localizes itself in an unusual site. Gallbladder involvement has been reported in numerous cases, the primary symptoms being "gallbladder colic and jaundice due to obstruction of the bile passages and/or irritation and edema of the ampulla of Vater"[6] A *Giardia*-associated brain lesion, reported in a child, was thought to be similar to meningoencephalitis caused by *Entamoeba histolytica*[7]. Finally, *Giardia lamblia* infection of the vagina has been reported.[8]

Most of its recent attention from epidemiologists and other workers has related to investigations of waterborne outbreaks in the United States or outbreaks associated with travel to foreign nations[9–13]. In

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Communicable Disease Epidemiologist, Minnesota Department of Health.

Laboratory studies were performed under the supervision of Mr. John McCullough, the late Dr. Leon Damsky, and Dr. Henry Bauer, Director, Division of Medical Laboratories, Minnesota Department of Health. Ms. Wendy McCullen, Ms. Jeanette Mature, Ms Peggy Peterson, and Ms. Ethelyn Yliniemi provided clerical support. Ms. Barbara Thorsen provided helpful advice. Ms. Linda Kay McGowan, Dr. Myron Schultz, Dr. Philip Brachman, Dr. David N Williams, Dr. Franklin G. Wallace, Dr John S Andrews, Jr., Mr Jack Mandel, Mr Rexford Singer, Ms. Eunice Sigurdson, Mr Martin Laventure, and Mr. Robert Knorr reviewed earlier drafts of this report and provided useful constructive criticism. The authors also acknowledge the cooperation and assistance of many patients and physicians.

Address requests for reprints to: Harold Weiss, Epidemiology, Norfolk Health Department, 401 Colley Avenue, Norfolk, VA 23507.

See editorial, page 801.

contrast, the present report contains a review of the overall epidemiology of this infection in Minnesota during 1971-1975, describes an investigation of giardiasis in Minnesotans who had not recently traveled abroad, and also contains a descriptive study of *G. lamblia* infections which persisted despite drug therapy.

Materials and Methods

Analysis of Surveillance Data

The Division of Medical Laboratories of the Minnesota Department of Health receives stool specimens for ovum and parasite examinations primarily from practicing physicians. It occasionally receives them from other laboratories in the state for confirmation of their identifications. Stool specimens, usually preserved in 10 percent formalin, are concentrated by the formalin-ether method and examined under a light microscope. All ova and parasites identified are recorded on the original examination requisition form, on which the patient's name, age, sex, address, "recent foreign travel" history,* date of symptom onset, and clinical diagnosis have previously been recorded. We tabulated and analyzed available data for all individuals whose stool specimens were received during 1971-1975 and were found to have cysts of *G. lamblia*.

Study of Giardiasis in Persons with No Recent Foreign Travel

Two of us (H.B.W. and D.A.W.) abstracted from state laboratory data for the period January 1974-February 1975 the names of all individuals with confirmed *G. lamblia* infection and no indicated recent foreign travel and the names of their physicians. After obtaining permission from the physician to interview the prospective subject, a telephone questionnaire was administered to each patient or to a parent of any child in the study. This covered demographic information (including occupation), clinical data (symptoms and time of onset and treatment given), and epidemiologic data (water sources, travel history, and contact with people or pets having similar symptoms). We accepted into the study group only those patients who could pinpoint acute onset of symptoms consistent with giardiasis and had no history of travel outside the United States during the two months before onset. We analyzed data primarily by type of recent travel.

Documentation of Treatment Failures

One of us (H.B.W.) performed an investigation to determine the frequency of cases that persisted despite drug treatment. To find such cases, we screened records of all 494 *G. lamblia* infections confirmed by the state laboratory between January 1 and August 8, 1975. We considered an individual to have a possibly persistent case if he or she had a record of two positive examinations at the state laboratory of stool specimens collected at least 10 days apart. (We used the 10-day interval because we assumed it to be the minimum period in which a physician could inform a patient of a positive stool examination, treat him, and obtain a follow-up stool specimen.) Next, we contacted the physician of each patient considered to have a possibly persistent case and determined if the patient was actually treated during the period between positive stool examinations. From each physician we obtained a detailed treatment record and permission to interview the patient. We defined a "persister" as an individual with persistent *G. lamblia* infection who had received specific treatment between positive stool examinations. We administered a questionnaire by telephone to as many persisters as we could reach. This covered demographic parameters, clinical information (symptoms, date of onset, and treatment), and epidemiologic factors (water sources, travel history, and contact with others with similar symptoms).

Results

Analysis of Surveillance Data

During 1971-1975 the Division of Medical Laboratories of the Minnesota Department of Health identified cysts of *G. lamblia* in the stools of 1,819 separate individuals. There was a precipitous rise during this period of identifications of this organism (Figure 1). In 1971 the state laboratory identified *G. lamblia* in 116 (3.1%) of 3,713 stool specimens examined for ova and parasites; in 1975 it identified

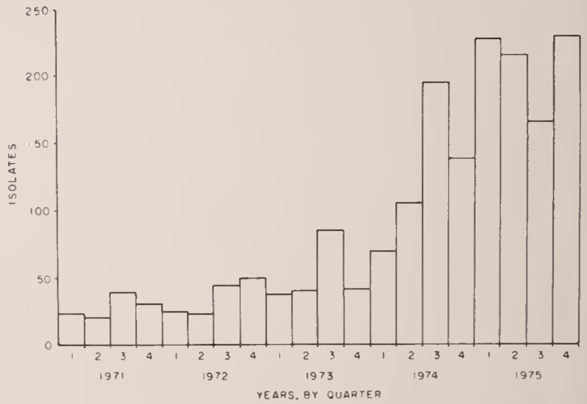

Fig. 1—Giardia lamblia identifications by state laboratory, Minnesota, 1971-1975, by quarter of year that stool specimens were received, newly diagnosed cases.

This also included recent residence in a foreign country this parasite in 840 (8.5%) of 9,938 stool specimens examined.

The leading months for receipt of stools positive for *G. lamblia* in newly identified patients were August, September, and October (Figure 2). Sixty-two percent of those with confirmed *G. lamblia* infection were residents of the two counties in which Minneapolis and St. Paul are located.† Two percent were residents of other states.

Cases were almost equally divided between males and females. Those in the zero-to-nine year age group had the highest percentage of cases and the highest attack rate (Table 1). Most patients had traveled abroad recently; for example, in 1975 the laboratory examination requisition forms indicated that 71% had traveled recently to at least 59 different countries on five continents. Of these, 118 (14%) had been in Korea, 104 (12%) in Mexico, and 69 (8%) in Vietnam. Only 13 (2%) had recently been in the Soviet Union. Of those who had recently been in Korea and Vietnam, approximately 95% and 58%, respectively, were under 10 years of age. In 1971, 12% of those with *G. lamblia* infection had at least one other parasite identified in their stools, and in 1975, 29% did. The parasites identified most frequently in combination with *G. lamblia* were *Ascaria lumbricoides, Trichuris trichiura,* and *Endolimax nana.*

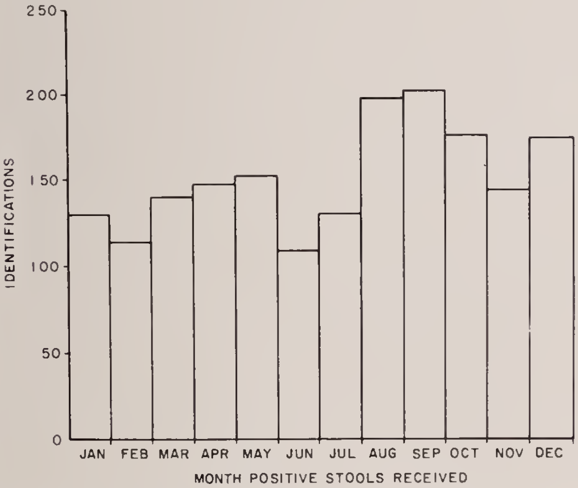

Fig. 2—Giardia lamblia identifications by state laboratory, Minnesota, 1971-1975, by month.

Study of Giardiasis in Persons with No Recent Foreign Travel

We abstracted from state laboratory data for January 1974-February 1975 the names of 166 individuals with *G. lamblia* infection and with no recent foreign travel indicated on the examination requisition form. We contacted 143 (86%) people and based on interviews accepted 78 into our study group. Both physician and patient cooperation was excellent. The 65 others were withdrawn from the study because they had either recently traveled abroad (the requisition form being incorrectly marked) or to a lesser extent because a time of symptom onset could not be established. The study group consisted of 42 females and 36 males, almost half of whom were in either the 20-to-29 or zero-to-nine year age group. Thirty-two percent had had onset in June, July, or August, 1974.

About half the group (46%) did not travel out of state within two months before initial symptoms. A higher percentage of those who had traveled out of state within two months before onset had consumed untreated water during this period than those who had not traveled out of state (Table 2). However, this difference was not statistically significant.

Fifteen (19%) of the 78 individuals had, within two

TABLE 1
Individuals with Confirmed *G. Lamblia* Infection, State Laboratory, Minnesota, 1971-1975, by Age Group and Sex

Age Group (Years)	Male	Female	Sex Not Reported	Total	Percent	Average Annual Attack Rate* (per 100,000)
0- 9	268	317	7	592	32.5	18.3
10-19	104	94	2	200	11.0	5.0
20-29	228	204	0	432	23.7	14.4
30-39	110	97	0	207	11.4	9.6
40-49	85	81	0	166	9.1	8.5
50-59	60	54	0	114	6.3	6.0
60a	23	57	0	80	4.4	2.5
Unknown	14	10	4	28	1.5	—
TOTAL	892	914	13	1819	99.9	9.3

*Based on the estimated Minnesota population during 1973.

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*From 1971 through 1975, the percentage of stools in which it identified other parasitic organisms remained about the same

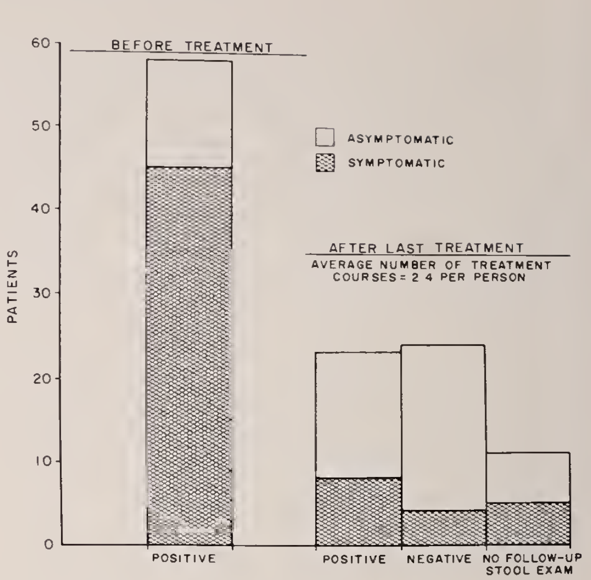
†These counties have 38 percent of the state's population.

months before onset, been in close personal contact with another person with either confirmed *G. lamblia* infection or symptoms consistent with giardiasis. Of the 14 children aged zero-to-nine years, 11 (79%) had at least one pet at home.

Documentation of Treatment Failures

We contacted the physicians of 83 patients. Again, physician and patient cooperation was excellent. Eighty patients met our criteria for persisters. We interviewed 58 of them; for the remaining 22 we were only able to obtain information from the state laboratory and patients' physicians.

There were 34 male and 46 female persisters. Most were in the zero-to-nine and 20-to-29 year age groups (30% and 24%, respectively). Most patients had received at least two treatment courses, and metroidazol (Flagyl*®) was the drug used most often (Table 3). Stools from 36 persisters (45%) were positive for *G. lamblia* after their last treatment courses, those from 25 (31%) were negative, and those from 19 (24%) were not examined. Of the 58 interviewed patients, 45 were symptomatic and 50



*NO PATIENTS WHO WERE ASYMPTOMATIC BEFORE TREATMENT BECAME SYMPTOMATIC

Fig. 3—Stool examination results and presence of symptoms among 59 interviewed persisters before treatment and after last treatment. We considered an individual symptomatic if he said that he had "unusual" loose bowel movements, abdominal cramps, and/or malodorous stools for two days or longer, or two or more episodes of intestinal symptoms similar to those experienced before initial treatment. Seventeen of the "negative" cases after last treatment were based on only one negative stool examination.

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*Use of trade names is for identification only and does not indicate endorsement by the U S Department of Health, Education, and Welfare or by the Public Health Service

TABLE 2

Analysis of the Study Group with No Recent Foreign Travel by Types of Domestic Travel and Water Consumption within Two Months of Onset

Group	Type of Travel	Number in Group	Water Consumption Untreated Well Water at Home*	Any Untreated Water
1	Only In-State	36	36%†	56%‡
2	In-State and Out-of-State	42	21%	69%
Total		78	28%	63%

*All other had municipal water.
†Includes one individual who switched from municipal to well water one week before onset.
‡There were no statistically significant differences between Groups 1 and 2 in consumption of untreated water at home or elsewhere within two months of onset

TABLE 3

Number and Type of Treatments for 80 "Persisters"

Treatment Course	Number Receiving Course	Percentage of "Persisters" Treated	Percentage Distribution by Drug Used For Each Course of Therapy Metronizadole	Quinacrine	Other
1	80*	100	91	6	3
2	66†	83	71	29	0
3	26†	33	46	50	4
4	4	5	100	0	0
5	2	3	50	50	0
Total	178	—	77	22	1

*Three patients reported not completing their first treatment courses, but two of them completed second courses (which also failed to eradicate their *G lamblia* infections).
†Five patients failed to complete either their second or third treatment courses.

reported taking all medication in all treatment courses. Seventeen of the 58 reported symptoms after their last treatment (Figure 3); 15 of the 17 had had two or more treatment courses.

Nineteen (33%) of the 58 interviewed persisters had been in close association with others who had confirmed *G. lamblia* infection, and an additional five persisters reported contact with at least one other person who had a "similar diarrheal-type illness." Twenty-two (92%) of these 24 persisters lived with or were close friends of the other persons.

During the two months before submission of the first positive stool specimens, 62 (78%) of the 80 persisters had traveled to at least one foreign country. During the first treatment course, seven of the 58 interviewed persisters had traveled outside of Minnesota, four of these to foreign countries.

Discussion

We considered the following factors that may have accounted for the increase in *G. lamblia* identifications by the state laboratory between 1971 and 1975. First, the number of people who had specimens examined by the state laboratory for ova and parasites almost tripled during this period. This may have been due to increased physician awareness of *G. lamblia* and other parasitic infections and of the availability of diagnostic services at the state laboratory. During the same period, however, the number of people whose stools were positive for *G. lamblia* increased over sevenfold. Second, there may have been an actual increase in giardiasis in Minnesotans. This may have occurred if Minnesota residents increased their foreign travel or if increasing numbers of aliens immigrated into the state. The high percentage of children under age 10 who had recently been in Korea and Vietnam suggests that many were orphans being adopted by Minnesotans. It appears that foreign travel was a major epidemiologic factor associated with infections and that many foreign nations were sources.

Our data were based on a large proportion of, but not all, laboratory-confirmed cases of *G. lamblia* infection in Minnesota. The number of *G. lamblia* infections identified by the state laboratory represents approximately two-thirds of these infections confirmed in the state. A recent survey of all laboratories in Minnesota, other than the state laboratory, indicated that during 1974 they identified *G. lamblia* in 295 individuals. This figure represents 37 percent of the 803 *G. lamblia* identifications in Minnesota in that year (Mature, J., Fahrman, G., Washburn, J.W., Levy, B.S. "A Survey of all Laboratories in Minnesota." Unpublished. 1976). A recent survey of a random sample of state physicians suggested a higher incidence, approximately 2,000 cases of diagnosed giardiasis in Minnesota in 1975.*

Our study of 78 infected individuals without recent foreign travel points out that giardiasis is not always imported into the United States from foreign countries or imported into Minnesota from elsewhere. The latter observation is supported by the 36 infected individuals who had not traveled outside of Minnesota during the two months before onset (Group 1, Table 2). Further study including the use of appropriate control populations (which this study lacked) is needed, however, to delineate the precise mode(s) of transmission of the parasite in Minnesota. It is generally believed that most cases of giardiasis are transmitted by consumption of contaminated water[1] and our results were consistent with this possibility (63% of patients consumed untreated water within two months before onset). But, in addition, it is possible that direct fecal-oral transmission of the parasite also occurs from humans and/or pets† (37% of patients did not drink untreated water within two months before onset). It is also possible that consumption of municipal water that has remained contaminated with *G. lamblia* after routine treatment accounts for some transmission.

Among the people with treatment failures we studied, the true rate of initial treatment failure, based on positive follow-up stool specimens, was probably higher than our finding of 16% for two reasons. First, not all of the initially screened population had a follow-up stool exam. Second, most patients that were followed up were judged to be free of *G. lamblia* cysts based on only one or two negative specimens. Because of varying numbers of cysts expelled in the stools and the possibly cyclic nature of their release‡ at least three stools should have been submitted to avoid a high rate of false negatives.

There was a high rate of treatment failure among the persisters, despite multiple treatments (Figure 3). After their last treatment, 45% of persisters still had stools positive for *G. lamblia*, and 29% of interviewed persisters were still symptomatic.

We ruled out failure to take the full and proper drug regimen as an important cause of persistence. In addition, the age-sex distribution and travel histories of the persisters were similar to those of all individuals with confirmed *G. lamblia* infections in 1971-1975.

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*Romero, R., Andrews, J.S., Levy, B.S. "Survey Indicates United Reporting of Diseases by Physicians" Manuscript in preparation.

†It has been established that there are distinct morphological similarities between *G. lamblia* and *Giardia* species which can infect domestic animals[14].

‡This also included recent residence in a foreign country

Therefore, these variables also probably played minimal roles in persistence.

Perhaps the most interesting finding, deserving more investigation, was that 41% of the persisters reported contact during their treatment with people with suspected or confirmed giardiasis. This raises the possibility that persistence may be caused in some cases by reinfection from the initial source of infection or through fecal-oral transmission from *G. lamblia* carriers.

We have shown that cysts persist in a significant proportion of patients treated for *G. lamblia* infection. Further epidemiologic studies and therapeutic trials involving appropriate control groups and intensive monitoring of stools or duodenal aspirates over long periods are needed to establish why persistence occurs. For example, a therapeutic trial composed of randomly allocated patients already infected into treatment and non-treatment groups could prove useful in quantifying persistence under the different conditions (variables) imposed on the trial. A first step in such a clinical trial should be isolation of both the treated and untreated groups from possible *G. lamblia* reinfection by control of water and food sources, vigorous personal sanitary procedures and elimination of contact with possible carriers, especially family, for the duration of the study. By examining or controlling for subgroups of the population (age, sex, travel, water sources, *etc*...) one may find and quantitate other differences worth evaluating.

References

1 Wolte, MS Giardiasis. JAMA 233-1362, 1975.
2 Schultz, MG Giardiasis JAMA 233:1384, 1975.
3. Mahomond, AAF, Warren, KS Algorithms in the diagnosis and management of exotic disease: II Giardiasis. J Infect Dis 130:6201, 1975
4. Ament, Marvin E. Diagnosis and Treatment of Giardiasis J Pediatr 80 (4) 633, 1975.
5. Danciger, M, Lopez, Manuel. Numhers of Giardia in the Feces of Infected Children Am J Trop Med Hyg 237-42 1975
6. Faust and Russel: Clinical Parasitology, Lea and Febiger, Philadelphia 1964.
7. Phan, AA: Letter to the Editor. Br Med J November 16 1 1974
8 Harris, JR, Morton, RS Sexual Transmission of Intestinal Parasites 49 393 1973.
9 Moore, GT, Cross, WM, McGuire, D, Mollohan, CS, Gleason, NN, Healy, GR, Newton, LM. Epidemic giardiasis at a ski resort. N Engl J Med 281:402, 1969
10 Brady, PG, Wolte, MS. Waterborne giardiasis. Ann Intern Med 81:498, 1974
11 Center for Disease Control: Giardiasis: Rome, New York Morh Mort Weekly Rep 24 366, 1975
12 Walzer, PD, Wolte, MS, Schultz, MG: Giardiasis in travelers. J Infect Dis 124.235, 1971.
13 Brodsky, RE, Spencer, HC, Schultz, MG. Giardiasis in American travelers to the Soviet Union. J Infect Dis 130:319, 1974
14 Burrows, RB, Hunt, GR Intestinal Protozoan infections in cats J Am Vet Med Assoc 157:2065, 1970

Memorials

By now you should all be well aware of the 1977 drive to support the Medical Student Loan Fund of the Minnesota State Medical Association Foundation. Response last year by the physicians of Minnesota was an inspiration to all of us who labored in the fund-raising vineyard. At the practical level it made possible the continuing medical education of every student who appealed to the Minnesota State Medical Association Foundation for help.

Of particular interest are special gifts. Special gifts were received: from the Charitable Foundation of the Hennepin County Medical Society, from the Goodhue County Medical Society, from the Minnesota Valley Chapter AAFP, from the Southern Minnesota Medical Association, from the Zumbro Valley Medical Society, from the Ramsey County Medical Society Auxiliary, and from the Mid Minnesota Medical Society. In addition to the enormous assistance given to the fund drive by the Auxiliary of the Minnesota State Medical Association was a particularly generous gift from the Auxiliary of the Hennepin County Medical Society. This was the result of herculean work by many loving and dedicated Hennepin County Auxiliary members in sponsoring a memorable antique show.

Two very special gifts are of importance, for they point to a way we can all think about and hopefully do something about. As a result of a gift from the Blake Family, there was established the James A. Blake Memorial Student Loan Fund. A second generous memorial was established by Dr. Abe Litman, dedicated to his parents, Isaac and Sarah Leah Litman. Special gifts can be used to establish memorials. We as physicians are strategically placed to encourage such perpetual reminders of loved ones. We can also urge our colleagues in affiliated medical societies and our spouses in auxiliary organizations of the value of this cause. If we can promote the Student Loan Fund, there will be many more gifts from industry, from auxiliaries, and best of all, many more memorials to friends, relatives and colleagues now gone.

So, in November make your gift to the Student Loan Fund of the Minnesota State Medical Association Foundation. Send your check to Suite 900, 101 East Fifth Street, St. Paul, Minnesota 55101.

John J. Regan, M.D.
Chairman

Preventive Medicine

Medical Economics, Professional Attitudes and Chronic Disease Prevention*

HENRY BLACKBURN, M.D.†

PROFESSOR JERRY MORRIS of London, one of the more respected teachers in Preventive Medicine, recently shocked an audience in Copenhagen with the statement, "It is often said that an ounce of prevention is worth a pound of cure. This is not so!" There was an audible gasp on hearing this apparent heresy from high places — until Professor Morris went on to say, "This is not so, because there *is* no cure!" Therein, I believe, is the essence of the need for prevention: simply, *there is no conventional cure for the major maladies of modern man, once they become manifest.*

But prevention efforts are strongly affected by medical traditions and education, by professional and public attitudes, and by the vagaries and interests of medical economics. Let me illustrate briefly some of these influences which serve to impede preventive researches and programs, and contribute to the lack of a sound and vigorous public health policy.

As one example, I recently experienced that very special sharpening of the senses which occurs on showing a visitor through one's own familiar haunts. This occurred while taking my youngest daughter, who is studying desert biology in the West, through the huge commercial and scientific exhibits of the American Heart Association Annual Meeting in the Miami Beach Conference Center. Several years of increasing discomfort in these exhibits on my part, recently bordering on alienation, were crystallized by looking with new eyes at the plethora of gadgets and technological advances, while trying to explain to her their use and purpose. It came to me, perhaps as it occurred to President Eisenhower about the Military-Industrial Complex, that here was part of a vast new Medical-Industrial Complex. *The vesting in this Medical-Industrial Complex largely determines the paths down which we move and leads medicine along ways having little to do with the Public Health.*

Medical education is an integral part of, and early contributor to, the workings of the Medical-Industrial Complex. For example, U.S. medical graduates have almost doubled in the last decade in what can hardly be considered a successful attempt to "improve medical care." And each medical graduate has emerged from a very unreal world of academia, having acquired many skills but among select patient populations afflicted by advanced or bizarre or uncommon diseases, and under highly competent but strongly biased teachers and technologists. Each graduate's legacy is a heavy vesting in the concepts, procedures and technology of the Medical-Industrial Complex.

For another example, I recently had a medical encounter in which the young subspecialist said to me, "The only thing I know how to do well is such-and-such's invasive technique. It's what I've been trained to do. Its yield is low, but if I can't do that procedure on you, there is no other way that I can help!" Thus, we create new technologies and train whole generations of physicians and technicians to use them, depend on them, and advance them, ad infinitum.

In turn, the medical establishment creates new administrative branches to deal with each major advance in medical technology, so that there becomes a heavy *bureaucratic* vesting in the Medical-Industrial Complex. And a bureaucracy is as close to permanence as anything in this society! Moreover, we reward people successful in this medical technological system by advancement to the highest review and policy-making bodies within the same Medical-Industrial Complex. Of course, these outstanding people we need to do basic research, or to care for us when we are seriously ill. But often the experts who arrive at service in high level, authoritative medical bodies bring limited backgrounds in questions of medical care delivery and often no concept or experience whatever of the public health! The education of medical policy leaders into the broader concerns of society and the public health, when it occurs at all, is slow and painful. Often it happens only by forced consideration of public health issues from the assumption of new positions of wide responsibility. How many distinguished U.S. leaders in Public Health are appointed to the Advisory Councils of NIH, to the National Academy (of Science, or of Medicine), or to the top posts of Assistant or Under-Secretary for Health in HEW? Are not they, and the public health, largely outside the Medical-Industrial Complex and its disease-oriented mainstream.

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*Excerpted from Comments on Receipt of the Dana Award for Preventive Medicine, jointly with Ancel Keys, from the American Health Foundation, New York City, November 30, 1976.

†Professor and Director, Laboratory of Physiological Hygiene, School of Public Health, and Professor of Medicine, School of Medicine, University of Minnesota, Minneapolis, Minnesota.

Perhaps as much as anything else, professional attitudes acquired in training and practice tend to impede preventive efforts. Throughout medical training and practice, particular concern is for the individual patient. This concern for the value of a human being is a hallmark of and ultimate fruit of Western philosophy. But interpretations and attitudes derived from observations and decision-making for the individual patient may be quite different from those derived from real world populations outside the hospital environment. Sole concern with manifestations in the sick patient results in different concepts and working procedures than those acquired in observations of whole cultures. Those prescriptions appropriate for the individual patient are not necessarily those appropriate to the public health.

Early in preparation for practice or for medical investigation, and in reading from *Arrowsmith* to *The Double Helix*, the student is inbued with awe, and delimited in respect, for the courageous experiment, the dogged persistence, the brilliant diagnosis, and the all-consuming faith in a single *specific* mechanism, a Golden Key, a Magic Bullet, a Serendipitous Breakthrough, a Holy Grail! Because, once or twice a generation, such a breakthrough does indeed occur (with vast rewards to mankind and no less concrete awards to the investigator!) the student's romantic ideal is crystallized and perpetuated. This model of search for "The" fundamental mechanism of disease appears to have created a totally blind spot in the physician and investigator. That blindness is to the reality that most of modern illness is due to the impact on specific intrinsic mechanisms, of (a) unhealthy personal behavior, within (b) a "polluted" environment, produced in turn by (c) distorted mores, values and peer pressures, and all profoundly moved along, pell mell, by (d) commercial interests and their blandishments.

Constant reminders of differences in professional viewpoint are statements by distinguished practitioners and investigators alike: "Most of my vascular disease patients have no risk factors," or, "There is no reason to modify the habits of any but those at high risk." In fact, comparison of distributions of risk characteristics in the real world outside the clinic show that whole cultures are set apart and whole populations are at excess risk due to their habits and risk factor levels. If personal, cultural and environmental characteristics are, as we believe, essential to the ubiquitous premature vascular diseases in this country, their modification in small groups of patients, or only among those at highest risk, within the already high risk culture, will be relatively ineffective as a public health measure. A national preventive strategy requires changes across the entire culture, in those at higher immediate risk but also among the young in process of developing characteristics which lead to early heart and lung disease.

But clearly, the medical profession considers its principal mission to care for the sick. As a group we have not been profoundly involved with the potential for elimination, or postponement, of the current maladies so strongly related to lifestyle and environment. The profession as a whole has yet to accept the challenge that another mission of medicine is to forestall disease and prevent its premature appearance.

Those of us who plow the fields of prevention are concerned not to supplant the essential and traditional functions of medicine, or reduce its basic research effort, but rather to arrive at a new balance of effort and priorities we believe essential. For example, it is estimated that within the Medical-Industrial Complex about 100 times more is spent in research on the cell biology of cancer (essential as is this research!) than for researches on stopping smoking, in other words, on cleaning up the personal environment which would rid us of a major burden of malignancies. Again, perhaps 20 times more monies are devoted for research on the production of a "safe cigarette" (exciting, important and efficient as this approach could be to the public health) than on research to reduce the national habit itself of cigarette smoking. Perhaps 50 times more is used on important research into the underlying mechanisms of fatty artery diseases than on effective community campaigns to detect, treat and follow-up on a major contributor to those diseases, hypertension. About twice as much money is applied every year in two rival programs to develop a totally implantable, long-term artificial heart than on even the most expensive of preventive trials, the Multiple Risk Factor Intervention Trial (MRFIT)! And of course, American society spends hundreds of millions of dollars annually in tobacco advertising leading to mass acceptance of and addiction to cigarettes. The U.S. government dispenses similar amounts in tobacco subsidies and in the care of the tragic and preventable cigarette-related diseases. All the while, that same government downgrades the status and the budget of the one small government agency which serves as a clearinghouse for information and research on the health effects of smoking. Further, the U.S. government spends millions to subsidize, and to encourage the over-consumption of, high fat meat and dairy products and eggs, while it does so very little in health education campaigns for prevention of the diseases of over-consumption.

Professional views and governmental priorities are not the only impediments to effective prevention efforts. Public attitudes in the U.S. are overriding; a balanced, active healthy lifestyle is a sinister form of deprivation from *The American Way!* In this "Way," the ultimate food is prime beef; the ultimate reward, ice cream; the acme of status, a huge automobile; the lowest class of activity is sweaty work; the acceptable, licensed and deserved solace is unlimited cheap alcohol and tobacco! What have government and the Medical-Industrial Complex actually contributed in leadership concerning these and myriad like values? Perhaps a warning in small print on cigarette packs and loose talk about Health Maintenance Organizations — which don't!

Why are a few people and institutions engaged at all in the prevention endeavor if it is so antithetical to the traditional medical mission and so unrelated to the accepted pursuits of the Medical-Industrial Complex? I suspect that they, and we, are deeply involved with prevention because we consider that the mission of medicine is every bit as much to forestall disease as it is to care for the ill, to promote health as well to rehabilitate the damaged. We believe also that with the recently gained "right to health care" of individuals goes their "*responsibility to care for health.*" This individual responsibility to care for health can only be assumed collectively by a well-informed and motivated public, guided by a cogent public health policy. I believe that some of us are in the field of prevention because of a longterm conviction that what we're doing, though sometimes tedious or even trite, is essential for any real future progress in reducing the individual and social burden of premature diseases. And I will leave you to define "premature."

I would like to express a basic optimism, over the longterm, about the potential for chronic disease prevention. Once recognizing the need, the American physician, within the existing medical system, will respond innovatively. There is evidence the system is beginning to stir in respect to preventive efforts.

Finally, I reckon that what we and others are prescribing — in terms of a balanced lifestyle, of physiological hygiene, of the Prudent Diet, of a reduced agricultural conversion of grain to beef, of a shift away from tobacco culture, and so on — are all *ecologically sound.* What those in prevention are recommending is compatible with planetary needs for the conservation and flow of energy. I have an impression that the public and the healing professions are coming to accept the fact that continued, ever-greater over-consumption will no more lead to "progress" in health than ever greater size and power of automobiles has led to "progress" in transport or energy!

Having indicated some of the professional views and attitudes that I suspect impede the progress of preventive efforts, I would like to go on to emphasize that these attitudes are clearly not born of professional ill-will. Rather, they derive from an overwhelming need that professional energy and skill and medical technology be directed toward caring for the ill, and by the training and tradition therein. There should never, of course, be any lessening of standards of diagnosis or skilled humaneness of therapy. Nor should there be any massive retreat from technology.

Rather, I would like to maintain that more humanity should be returned to medical care and more training, energies, and concern be directed to health in contrast to disease. Health promotion services should be on a par with prevention services which in turn should be as substantial as diagnostic, therapeutic and rehabilitation services.

Renewed professional views and leadership along these lines could provide new balance to the medical curriculum, breadth to the medical view, skills to the medical armamentarium, health to the public health and sanity to the health care scene!

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Precautions: In the elderly and debilitated, and in children over six, limit to smallest effective dosage (initially 10 mg or less per day) to preclude ataxia or oversedation, increasing gradually as needed and tolerated. Not recommended in children under six. Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider individual pharmacologic effects, particularly in use of potentiating drugs such as MAO inhibitors and phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions (*e.g.*, excitement, stimulation and acute rage) have been reported in psychiatric patients and hyperactive aggressive children. Employ usual precautions in treatment of anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation have been reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship has not been established clinically.

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(Continued on page 838)

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References:
*National Disease & Therapeutic Index, Jan.-Dec., 1976. IMS America Ltd., Ambler, Pa. 1976.
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Grand Rounds

Shock Lung

DAVID ALBRIGHT, M.D.*

The clinical syndrome of shock lung has been defined and its clinical setting, pathology, and x-ray pictures described. Various etiologies have been discussed with special emphasis on a posible centrineurogenic etiology. A number of treatment modalities are reviewed.

IN 1934 HURTADO[1] DESCRIBED the pulmonary pathologic changes of a clinical syndrome called shock lung. Not until 30 years later did the syndrome begin to receive widespread attention. Recent experiences with Vietnam casualties and in intensive care units have increased this attention. This paper will briefly review the current literature on shock lung.

TABLE 1
Synonyms for Shock Lung[2]*

- Adult hyaline membrane disease
- Adult respiratory insufficiency syndrome
- Bronchopulmonary dysplasia
- Congestive atelectasis
- DaNang lung
- Fat embolism
- Hemorrhagic atelectasis
- Hemorrhagic lung syndrome
- Hypoxia hyperventilation
- Oxygen toxicity
- Postperfusion lung
- Postransfusion lung
- Posttraumatic atelectasis
- Posttraumatic pulmonary insufficiency
- Progressive pulmonary consolidation
- Progressive respiratory distress
- Pulmonary edema
- Pulmonary hyaline membrane disease
- Pulmonary microembolism
- Pump lung
- Respirator lung
- Shock lung
- Stiff lung syndrome
- Traumatic wet lung
- Transplant lung
- Wet lung
- White lung syndrome

*From Blaisdell FW and Schlobohm RM: The respiratory distress syndrome: A review. Surg 74:251-262, 1973. By permission.

Definition and Clinical Description

Presently, its definition, even its name, is unclear. Blaisdell[2] lists 27 synonyms for this syndrome (Table 1). For simplicity, we have chosen to use the term shock lung. The use of this term in no way implies that systemic shock is an absolute prerequisite for developing the syndrome.

For purposes of this paper, we define shock lung as progressive respiratory insufficiency *not* primarily due to pulmonary edema secondary to cardiac failure or overhydration, aspiration or bronchopneumonia, pneumothorax, chronic obstructive pulmonary disease, pulmonary embolization, pneumoconiosis, or pulmonary contusion. Clinically, it is characterized by tachypnea, progressive dyspnea, hypoxia refractory to increasing levels of inspired oxygen, decreasing lung compliance and diffuse alveolar infiltrates on Xray.[3] Following a severe insult, shock lung typically takes one to three days to develop although latent periods of up to 15 days have been described.[4] The lungs are usually "dry" to auscultation and pulmonary secretions may be minimal.[5] Shock lung may develop in a wide variety of clinical settings (Table 2).

Radiographic and Pathologic Description

Radiographically, shock lung is characterized initially by the appearance of nonspecific, scattered, ill-defined bilateral pulmonary densities which progress to the classical picture of diffuse bilateral alveolar infiltrates and eventual com-

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TABLE 2
Clinical settings in which Shock Lung Appears[2]*

Amniotic fluid embolism[6]
Arterial emboli[7]
Bowel infarction[8]
Burns
Carcinomatosis
Cardiopulmonary bypass
Clostridial sepsis
Drug abuse[10]
Eclampsia
Fractures
Gram-negative sepsis[9]
Heat stroke
High altitude pulmonary edema[14]
Major surgery
Malaria[12]
Multiple transfusion
Peripheral vascular disease[13]
Ruptured aneurysm
Shock
Transfusion reaction
Transplantation[11]
Trauma
Viral Influenza[15,16]

*From Blaisdell FW and Schlobohm RM: The respiratory distress syndrome: A review. Surg 74:251-262, 1973. By permission.

plete consolidation.[17] These infiltrates are frequently misinterpreted as cardiac pulmonary edema but in shock lung vascular markings are not prominent and cardiac size is not increased;[5] also, these infiltrates develop and resolve slowly, requiring many days to completely clear. Finally, the clinical occurrence of "pure" shock lung is unusual and the x-ray picture may be complicated by other pulmonary pathology.

The pathological changes seen are dependent upon the severity of the syndrome and length of patient survival. In those patients dying within 18 hours of the clinical insult, the gross appearance of the lung may be unremarkable with the exception of a few scattered areas of atelectasis and dependent congestion.[5] Within 24 to 48 hours, the lungs are grossly hemorrhagic and resemble liver. If the patient survives for five to seven days, the areas of hemorrhage become progressively less obvious and the lungs appear grayish and edematous.[2] If death occurs within the first few hours following the clinical insult, light microscopy reveals the presence of pulmonary microemboli and early capillary and venous engorgement.[5] Electron microscopy studies have demonstrated the presence of platelet clots in varying stages of degeneration and loss of cellular membrane integrity with occlusion of capillaries by amorphous and erythrocyte aggregates.[18] By 18 to 72 hours the microscopic changes are more marked and include severe venous congestion, thromboemboli, interstitial edema, and peribronchial, perivascular, and intra-alveolar hemorrhage. Over the next two to four days, these changes are gradually replaced by hyaline membranes.[5] Should death occur two to three weeks following the clinical insult, diffuse pulmonary fibrosis may be seen.[2] Unfortunately, there are no studies to show which, if any, pathologic changes persist with long-term survival.

Etiology

The exact etiology of shock lung is unknown. A number of theories, which follow, have been proposed to define the etiology of this syndrome.

Fluid Overload

Fluid overload was one of the first theories proposed. It received considerable attention in the late 1960's because of experiences arising out of the Vietnam War. It was noted that critically injured servicemen who received massive volumes of fluids during successful resuscitation attempts frequently developed shock lung, and it was proposed that this was secondary to inadvertent overhydration.[19,20] Shock lung, at least in part, responds to diuretic therapy and this is felt by some to implicate overhydration as the etiologic factor.[4] Nonetheless, numerous studies have failed to establish any direct relationship between fluid overload and shock lung.[21,22] Blood volume studies of wounded servicemen who developed shock lung have demonstrated that none were hypervolemic and, in fact, almost all remained hypovolemic after resuscitation.[20] Fluid overload cannot be considered the etiology of shock lung.

Oxygen Toxicity

Prolonged exposure to high levels of inspired oxygen can cause abnormalities in respiratory function and pathological changes similar to those seen in shock lung. Accordingly, oxygen toxicity has been suggested as causative. However, patients with normal lungs exposed to inspired oxygen concentration of 100% for up to four to five days develop only minimal pathological changes in their lungs.[23] In shock lung severe pathological changes are known to develop earlier. The possibility that a previously damaged lung might be more susceptible to oxygen toxicity and therefore develop clinical and pathological changes sooner is not borne out by the work of Winter, et al., who found that the tolerance to toxic levels of oxygen was not reduced by prior pulmonary injury. In fact, there may be a dose-dependent temporal protection against death from oxygen toxicity by such prior damage.[24] Moreover, it has been shown that exposure of a portion of the lung to a P_iO_2 in excess of 3,500 mm Hg does not produce pulmonary lesions in the absence of systemic hyperoxia.[25] If systemic hyperoxia, rather than direct pulmonary contact with elevated levels of oxygen, is the etiology of the pulmonary damage of oxygen toxicity, then oxygen toxicity, per se, should not be considered as the etiology of shock lung.

Surfactant Abnormalities

Atelectasis plays a prominent role in shock lung; and, therefore, it has been proposed that defective surfactant production may be an etiologic factor in the syndrome.[3] Although there is a decrease in surfactant activity in the dog lung 18 to 72 hours after the induction of shock,[26] it is unclear whether this has any significance in the clinical syndrome of human shock lung. At present, although surfactant may play a role in the development of shock lung, it is indeterminate whether this is an initiating or a resulting event.[27]

Multiple Factors

Many investigators believe that the development of shock lung requires the presence of multiple etiologic factors.[28,29] Safar et al.[29] compiled a list of possible pathogenic factors which they broke down into a group of "initiating factors" including: (1) pulmonary artery hypoperfusion, (2) alveolar hypoxia, (3) reduction in bronchial artery oxygen transport, and (4) a group of "additional factors" including oxygen toxicity, transfusion with bank blood, possible fluid overload, secondary pulmonary infection, uremia, aspiration, fat emboli, left heart failure, septicemia, and lung contusion. They then reviewed 22 fatal cases of shock lung to see which factors were present in each of the patients. A review of their data reveals that all three "initiating factors" were present in 73% of patients, two, in 95%, and one, in 100%. In addition, all patients had at least one of the "additional factors," with 68% having three to four of them. Using all possible pathogenetic factors combined, no patient developed shock lung with fewer than four factors involved. They then state that the data support the multiple factor hypothesis of the pathogenesis of shock lung. However, the mere presence of multiple "suspected pathogenetic factors" in no way implies a causal relationship between any of those factors and the development of shock lung. All of the patients in their study apparently had significant episodes of hypoxia, and this factor *alone* is sufficient to cause shock lung. Secondly, they have included in their "additional factors" two entities, oxygen toxicity and fluid overload, which, as discussed previously, cannot alone be implicated in the etiology of shock lung. Finally, their study points out one of the difficulties encountered in any review of shock lung: that is, they have included in their suspected pathogenetic factors four entities (pneumonia, aspiration, left heart failure, and lung contusion), which, by definition, are excluded from the discussion of shock lung.

Intravascular Coagulation

Despite the fact that shock lung can occur in a wide variety of clinical settings, many investigators believe that there is a common mechanism which can account for its development. Pulmonary microemboli have been a consistent, early pathological finding in shock lung,[2,5,9,18,30] leading Blaisdell and others to propose that intravascular coagulation is the common mechanism.[30] Figure 1 is a schematic representation of this pro-

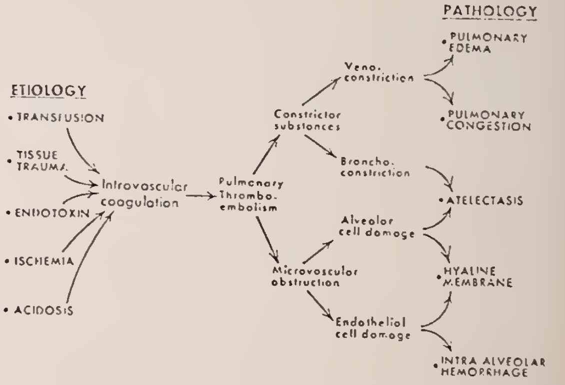

Fig. 1—Diagram showing the proposed route by which DIC leads to shock lung.[30] (From the article by Drs. F. W. Blaisdell, R. C. Lim, Jr. and R. J. Stallone: The Mechanism of Pulmonary Damage Following Traumatic Shock. Surg Gynec Obstet 130:15, January, 1970. By Permission.)

posed common mechanism. Patients with shock lung have multiple problems which can precipitate disseminated intravascular coagulation (DIC), such as massive transfusion and transfusion reactions,[31] tissue trauma with mobilization of tissue thromboplastin, bacterial toxins which precipitate platelet aggregation with release of thromboplastin,[9] ischemia and acidosis.[30] Whatever the cause of DIC, the released products are carried to the pulmonary vascular bed until the microcirculation is reached. Stasis in the microcirculation may in turn lead to further thrombus formation with pulmonary damage.[30] Thromboemboli can cause pulmonary damage either by the liberation of potent broncho- or vasoconstrictor substances or by the obstruction of pulmonary circulation. Vasoactive amines, such as serotonin and histamine, are released from platelet microemboli causing both vasoconstriction, which may lead to pulmonary edema and congestion, and bronchoconstriction with increased airway resistance, which may lead to atelectasis.[30] Thromboemboli also produce mechanical obstruction of the pulmonary microcirculation, causing both alveolar cell damage, with compromised surfactant production leading to atelectasis, and endothelial cell damage, with loss of vascular integrity causing the extravasation of fluids into alveoli and the formation of hyaline membranes.[30]

This, then, is the proposed mechanism by which DIC causes the shock syndrome. Although it is an attractive hypothesis with some clinical and experimental data to support it,[18,32,33] there are several questions which need to be resolved. First, it is extremely difficult to demonstrate DIC in many patients with shock lung. Secondly, if DIC is the etiology of shock lung, why then don't all patients with clinically significant DIC develop shock lung? Thirdly, if vasoconstrictor substances released by platelet aggregates play an important role in the pathogenesis of shock lung, then histamine or serotonin antagonists ought to be effective in at least partially preventing this syndrome. This has not yet been demonstrated. Fourthly, assuming that vasoactive substances do play an important pathogenetic factor does not imply that DIC-induced platelet aggregates are the only significant source of such substances. There is experimental evidence to suggest the accumulation of increased numbers of degranulated mast cells,[34] and the release of prostaglandins and other biologically active humoral substances by the lung.[35] The role these substances may play in the etiology of shock lung needs further exploration. Finally, if DIC is indeed the etiology of shock lung, why then does complete denervation of one lung protect that lung from the subsequent development of shock lung?

Central Nervous System-Pulmonary Interactions

In 1939, Weisman first called attention to a possible relationship between central nervous system disease and shock lung.[36] Several experiences arising out of the Vietnam War have also recently suggested that there may be a CNS etiology of shock lung. First, approximately 85% of those servicemen who died of head injuries, some within minutes of the injury and with little or no blood loss, were found at autopsy to have the full-blown picture of shock lung. Secondly, those who died of similar head injuries but had also suffered cervical cord transection did not develop shock lung.[20] These and other clinical and experimental observations have led some investigators to believe that the etiology of shock lung lies with a disorder of the central nervous system.[20,37,33] They have postulated that in shock lung the initiating trauma, regardless of the clinical setting, is an interference with hypothalamic cellular metabolism which leads, inappropriately, to an autonomically mediated increase in pulmonary venular resistance. This "tourniquet effect" in turn results in the clinical and pathological picture of shock lung.[37]

The belief that in shock the CNS is protected by safeguard hemostatic mechanisms has been eliminated by studies showing that in severe blood loss, transient and precipitous decreases in CNS perfusion take place.[20] Also, within minutes of severe hemorrhagic shock, there is evidence of marked CNS intracellular dysfunction: a tenfold rise in CSF pseudocholinesterase levels, a doubling of CSF potassium, and a decrease in CSF pH levels from a pre-shock mean of 7.42 to a post-shock mean of 6.60.[39]

Thus, there is ample evidence that shock can cause profound CNS damage, and the next obstacle to be overcome is the development of a workable experimental model. Figure 2 shows a schematic diagram of the model developed by

Moss and his group.[20] A common carotid artery in the experimental animal is isolated, ligated, and the distal end cannulated. Venous blood is withdrawn from the right atrium, run through a pump and filter, and infused into the distal end of the ligated carotid at a pressure 10 to 20 mm Hg above the systemic blood pressure. By this method, the circle of Willis is filled with perfusate which flows retrogradely down the contralateral vertebral and carotid arteries preventing them from contributing to cerebral blood flow.

Using this model to induce isolated cerebral hypoxia, several groups of investigators have compiled data to support the theory that shock lung is a disorder of the central nervous system. Moss et al. perfused the brain with mixed venous blood at a pO_2 of 35±5 mm Hg and were able to induce shock lung in 18 of 18 dogs.[37] Systemic arterial oxygen saturation, blood volume, and arterial blood pressure remained within normal limits, thereby eliminating them from consideration as possible etiologic factors.[20] Twelve control animals were subjected to the same procedure, except that their brains were perfused with normally oxygenated blood from the proximal carotid artery; none developed shock lung. This excludes the procedure, rather than the cerebral hypoxia, from causing the shock lung.[37] The pulmonary response to cerebral hypoxia is universal and species-independent,[40] strongly suggesting a similar response in man.

Further support of a CNS etiology of shock lung was provided by Sugg, et al., who demonstrated in dogs subjected to cerebral hypoxia that the surgical resection and reimplantation of one lung prevented the development of pulmonary lesions in that lung.[41] Pulmonary vasoconstriction is a central feature of the proposed CNS etiology of shock lung. Sugg and his group identified the site of vasoconstriction and found that it was under central neural control. Experimental hypoxia causes an elevation of total pulmonary vascular resistance. By using open-chest wedge catherization of both the arterial and venous pulmonary circulation, Sugg et al. localized this dramatic and prolonged rise in resistance to the pulmonary venule.[42] This is exactly the site of vasoconstriction predicted by the proposed theory under discussion and lends direct experimental support to that theory, as does the fact that Sugg and his group also provided experimental evidence showing neural control of vasoconstriction.

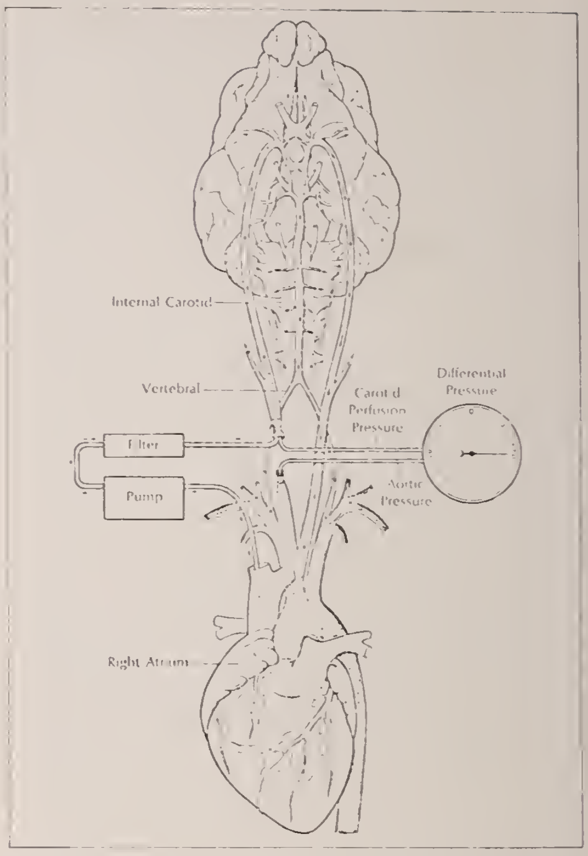

Fig. 2—Schematic diagram of experimental model for producing isolated cerebral hypoxia.[20] (See text for explanation.) (From: Moss, G.: Shock Lung. A disorder of the central nervous system. Hospital Practice 9:77, August, 1974. By permission.)

In dogs whose left lung had been completely denervated by auto-transplantation, they were able to show consistently lower pressures in the left pulmonary venule as compared to the right pulmonary venule.[42]

Treatment

The lack of understanding of the pathophysiology of shock lung has led to the clinical trial of a variety of therapeutic regimens with varying outcomes. The obvious first step is the treatment and correction of any possible precipitating or complicating factors in these patients. Hypoxia, hypotension, hypovolemia, and acidosis must be corrected and other routine supportive measures undertaken. To date, no controlled studies on the effectiveness of any particular treatment modality have been done.

Fluid Balance

Although total body fluid overload does not play an important part in the pathogenesis of shock lung, careful attention to fluid balance can reduce the incidence or severity of pulmonary congestive complications. Replacement fluids given should be similar in quantity and quality to those lost to avoid alteration in the intravascular osmotic pressure and inhibit the transudation of fluid within the lung. The simultaneous use of furosemide and colloids such as plasma or salt-poor albumin has been advocated and is probably helpful in facilitating the removal of extravascular lung water and improving pulmonary function.[4,27,43] Such treatment is ideally monitored with the use of a Swan-Ganz catheter.

Heparin

The use of heparin is advocated by those who feel that DIC is central to the pathogenesis of shock lung. Because of the potential hazards of heparin administration and its uncertain effectiveness in preventing ongoing DIC, the drug probably should be used only when DIC has been adequately documented.[28]

Steroids

Perhaps the greatest controversy in the treatment of shock lung centers around the use of steroids. There are no controlled studies to document their effectiveness, and many investigators feel that steroids play, at best, a very limited role in the treatment of shock lung.[2,3,20,28] Citing evidence that steroids decrease leukocyte agglutination and platelet adherence within the lung, aid in the preservation of alveolar type II cells, possibly enhance surfactant production, and stabilize cell and lysosome membranes, other investigators feel that steroids play an important role.[43,44] When used, steroids should be given early and as a bolus.[43] Wilson states that only methylprednisolone is effective in preventing or ameliorating the deleterious effects of hemorrhagic shock on the cellular architecture of the lung. This drug was effective when given in pharmacologic doses *before* the induction of hemorrhagic shock in experimental animals.[44] In summary, the possible effectiveness of steroids in the treatment of shock lung is unknown at present and the answer must await further controlled studies.

Positive End-Expiratory Pressure (PEEP)

There is no question about the effectiveness of continuous positive pressure breathing in the treatment of shock lung. The use of a volume respirator delivering PEEP is the cornerstone of the treatment of this syndrome. Apparently by preventing alveolar collapse during expiration and thereby improving ventilation-perfusion relationships, PEEP is an effective means of significantly improving arterial oxygen saturation levels.[45,48] Although PEEP has no significant adverse effects on CVP, arterial blood pressure, pulse rate, or urine output,[45] some studies demonstrate a statistically significant decrease in cardiac output at mean end-expiratory pressures of 10 cm H_20 or greater.[46] This may limit the amount of PEEP one can use in a given patient. There is a 15% incidence of spontaneous pneumothorax in patients on PEEP.[49,50] This must be kept in mind should a sudden deterioration in the clinical status of the patient occur.

Extracorporeal Oxygenation

Finally, the use of prolonged extracorporeal oxygenation must still be considered experimental. Using a membrane oxygenator for periods ranging from three to 12 days, Fallat et al. recently reported the long-term survival of two of 17 patients.[51] Although further studies are needed, the membrane oxygenator may be useful in the treatment of shock lung in certain carefully selected patients.

References

1. Hurtado A: Respiratory adaption to anoxemia. Amer J Physiology 109:626, 1934.
2. Blaisdell FW, Schlobohm RM: The respiratory distress syndrome: a review. Surgery 74:251, 1973.
3. Ashbaugh DG, Bigelow DB, Petty TL, Levine BE: Acute respiratory distress in adults. Lancet 2:319, 1967.
4. Fleming WH, Bowen JC: The use of diuretics in the treatment of early wet lung syndrome. Ann Surg 175:505, 1972.
5. Blaisdell FW: Respiratory insufficiency syndrome: clinical and pathological definition. J Trauma 13:195, 1973.
6. Meigs LC: Amniotic fluid embolism. Amer J Obstet Gynecol 111:1069, 1971.
7. Stallone RJ, Blaisdell FW, Cafferata HT, Levin SM: Analysis of morbidity and mortality from arterial embolectomy. Surgery 65:207 1969.
8. Horwitz CA, Ward PC: Disseminated intravascular coagulation, nonbacterial thrombotic endocarditis and adult pulmonary hyaline membranes—an interrelated triad? Amer J Med 51:272, 1971.

9-51. May be secured from the author.

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(Continued from page 826.)

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(Continued to page 848.)

Health Care Cost Commission

"Physicians can and must play a major role in reducing or at least stabilizing health care costs." Those challenging words came from Richard J. Frey, M.D., Chairman of the Council of the Minnesota State Medical Association and Chairman of the MSMA Health Care Cost Commission.

The Commission, which held its first meeting in May, is conducting an 18-month study of rising health care costs. It will issue "independent" recommendations that will go straight to the people without alteration by the Association.

The Commission's members include: representatives from civic affairs, industry, banking, insurance, state government, labor and hospitals as well as from medicine.* In addition, a member of the Minnesota Legislature (Senator B. Robert Lewis) was appointed by Governor Rudy Perpich who told the Association that he strongly supports this effort.

The MSMA Commission will be meeting every other month during the next 18 months. At each of those meetings, major presentations are made on key issues relating to health care cost. MINNESOTA MEDICINE will provide the full text of those presentations. We believe it is vital to our readership to be kept apprised of the work of this Commission and have the opportunity to review position statements by key figures in the health care industry, government, and the private sector as it relates to what the public perceives as the most serious problem facing the medical profession.

Chester A. Anderson, M.D.
President

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*See Minnesota Med 60:8-564, 1977 for names of members.

Analyzing the Cost of Health Care*

An Examination of Alternative Futures

TOR DAHL†

IN THE AZTEC culture, the available resources set an effective limit on the survival of the nation. Each year, the Aztec priests totalled the amount of foodstuff available, and divided this by the minimal annual requirement for an Aztec. If there was food for 30,000 Aztecs and the population was 35,000, an intricate selection mechanism was activated, whereby 5000 Aztecs were chosen to give their lives. In a solemn procession the individuals destined to die walked to the top of the Pyramid of the Sun where their hearts were excised and thrown into the bowl of the reclining god figure of Chacmol.

We cringe at the spectre of this bloody ritual. But on closer examination, we realize that the Aztecs did not have a choice of whether 5000 people were to die or not. Their choice was only whether they should have a say in the process. They chose to exercise the right to decide who should live.

In the 1960s, the country of Holland pondered whether it should raise the dikes so that floods would occur only once every century, instead of once every decade. To do so, would cost, say $10 million over a decade. This would save 10 lives. But if $10 million were to be invested in highway safety, 100 lives would be saved. The Dutch were faced with a paradox: If one happened to be a drowning Dutchman, one's life was worth 1 million, but if one happened to be a Dutch highway accident victim, one's life was worth only $100,000.00.

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*A presentation to the Health Care Cost Commission at the Meeting in St. Paul, May 27, 1977.

†Associate Professor, Department of Hospital and Health Care Administration, University of Minnesota.

At the same time, a study in the United States indicated that the marginal cost of saving a life on the highway was less than $10.00.

We are faced with a sober realization: We do not have a choice whether we put a price on human lives or not. Our only choice is whether we shall set such a price, and know about it, or whether our decisions shall set this price for us, and we shall unknowingly accept it.

By making decisions about how health resources should be allocated, we choose who shall live, and we implicitly set a price on human life. We like to say that the value of a human life is infinite. But if that was the case, there would be no wars, no airplanes taking off, no uncontrolled intersections, no smokers, no cars going faster than 20 miles per hour.

Clearly lives are not considered infinitely valuable, and the only question is: How valuable is a human life?

In 1853, William Farr calculated the value of the life of an Englishman:

At birth	5
Age 5	56
10	117
15	192
20	234
25	246
30	241
55	138
70	1
80	-41

Similar calculations have appeared with monotonous regularity up to the present. They present an impossible ethical dilemma. This dilemma cannot be avoided. And therein lies the crucial charge to this commission.

Control of health care costs start with objectives and budgets. Objectives and budgets imply resource allocations. This follows whether one focuses on reducing growth in prices or total costs (such decisions favor the current allocation pattern) or whether the mixture of services and capital investments should be altered. In any case, your recommendations will bear directly on how funds ultimately are allocated, and eventually, on who shall live. The latter follows simply from the observation that care delivered, is also care denied. Resources spent for one purpose automatically preclude the same resources from being spent elsewhere. Thus if we are softheaded about saving lives, we better be hardheaded about how we allocate health care resources.

Why the Recent Concern About Health Care Costs?

As a percentage of Gross National Product, health care costs have increased from 4.6% in 1950 to 7.7% in 1974, and is approaching 10% for 1978. In dollars, total health care costs have increased from 26 billion in 1960, to 104 billion in 1974 and will reach 160 billion in 1978. Per capita costs wer $78 in 1960, $485 in 1974 and will approach $773 in 1978. Annual increases have consistently outpaced the consumer price index, and usually by a factor of two, or twice as great an increase.

When a sector of the economy expands this rapidly, there must be some very special reasons for it. It is a unique phenomenon in American economic history that one sector has expanded so much so fast. While the sector soon will consume 10% of GNP, it employs less than 5% of the total labor force. With a labor/capital ratio roughly equal to that of the economy as a whole, this implies that revenue — personnel ratio in the field of health is double that of the economy as a whole. This alone will lead to pressures of expansion, where the best and brightest are likely to continue to seek employment in our field, particularly as other service sectors, such as education, are stagnating. But expansion cannot go on forever, and remuneration cannot remain exceptionally high in the face of even a slowed expansion. But the process has a significant implication—the sheer number of people employed in the health care sector now constitutes a substantial political influence in our society which is likely to resist changes that impinge on privileges gained or territory conquered.

How Has It Been Possible to Increase the Health Sector Share of the GNP So Rapidly?

Personal Income

There is now evidence that health care is not primarily viewed as a necessity, but has taken the characteristic of (in economic jargon) a superior good. Surveys have indicated that expenditures on health care increase as income increases, and in particular, expenditures for hospital stays. Thus the rise in real personal income has created additional demand for health care which in turn has made it possible to increase the GNP share.

Growth of Private and Public Insurance Coverage

There is no doubt that this constitutes the single greatest cause of increased demand for health care. The direct effect of insurance is to lower the net price paid by a health care consumer, and thereby cause him to seek more care. The portion of private hospital expenditure paid by insurance increased from 34.6% in 1950 to 73.7% in 1978. This implies that if the average cost per patient day had remained at the 1950 level of $15.62, the average net cost would have fallen from $10.22 (65.4% of $15.62) to $4.10 (26.3% of $15.62) in 1968. In actual dollars, this net cost figure rose to $19.00 in 1968, but this increase represents practically no change in constant dollars.

If we add the effects of government payments for hospital care, the proportion of third party payments for hospital care increased from 51.4% in 1950 to 84.2% in 1968.

The insurance mechanism, as growth has occurred in health care costs, has masked the direct impact on the consumer, and in fact made it possible for him to reduce the visible, out-of-pocket share for health care costs. Hence the incentive for the consumer was to take advantage of the increasingly attractive offer of high quality health care at a steadily reduced out-of-pocket share of total personal income. However, with coverage approximating an upper limit, out-of-pocket costs can no longer be similarly offset, and public awareness of health cost increases has been drastically altered.

Demographic Changes

The need for health care is very sensitive to age and sex distributions in the population. In an aging population, demand for health care services increases as the age distribution shifts upwards. However, during the period of 1950 to 1968, increases in the youthful population (under 25) from 42% to 47% offset the 8% to 10% increase in the above 65 population, thereby leaving no net increase in the demand for health care. The steadily increasingly median age of the U.S. population, however, will undoubtedly cause upward pressures on health care costs in the future.

Attitudinal Changes

It is fair to say that there has been a growing understanding of the need for proper health care over the last two generations. An increased faith in curative medicine and a new confidence in modern medical technology have led to an unprecedented public acceptance of modern medicine and its highly developed technology. In fact, this attitudinal shift has been carried so far that responsibility for an individual's health has been transferred from the individual himself to the physician, and now represents a serious obstacle in efforts attempting to change deleterious life styles and poor health habits. We have indeed verified Dr. Freyman's observation that "apparently it has always been easier to depend upon healers than living wisely."

Available Capacity

Milton Roemer is credited with the proposition that supply of beds "creates its own demand." A similar observation may be made about highly specialized professionals. It has been shown that everything else being equal, the fact that empty hospital beds are available, tends to increase demand for hospital care. Other studies have shown that more surgery is performed where there is a higher prevalence of surgeons, and this pure availability effect has in turn contributed to increases in the total health care costs.

Physician As A Creator of Demand

It is generally agreed that the physician guards the entry into the health care system. It is not generally understood how this role also contributes to the increase in demand by consumers. Clearly a patient is influenced by his physician's judgment and recommendations, and in many instances must solely rely on this judgment as the basis for making decisions about demanding health care. Very rarely is a supplier of service also in a position to affect the demand for that same service. The effect of such a role becomes very obvious in cases where a physician chooses to practice "defensive medicine", and orders tests that under other circumstances would have been considered to be of marginal value, or even superfluous.

The Problem of Incentives

Expanding our perspective of how increased demand has been facilitated, it is important to consider how the health care sector has reacted in meeting this demand.

Simply it may be stated that a physician has an economic interest in the ill health of his patients. This is an oppositely directed influence as compared to his professional interest, which is that of keeping his patients healthy.

The hospital is financially better off the higher its occupancy rate is—empty beds represent a waste of resources, and a serious drain of services. Thus hospitals have a vested economic interest in the ill health of the population.

The insurance industry is, of course, dependent upon a clear need for its services, which stems from the incidence of disease. Particularly in the expanding area where private insurers are administrators of medicare and medicaid reimbursements and are paid on the basis of claims settled, there is a direct economic interest in the ill health of the population.

The last part of the system is the consumer. If he carries a conventional insurance policy, he will find that he is, in a sense, economically better off the sicker he is, for it is at that time that his insurance reimburses his costs most adequately.

Thus we have a system in perfect harmony—everyone is financially better off the worse off the population is. It is a system of perverse incentives, and a system that serves as an engine of inflation and costly expansion in the health care sector.

Other aspects come to mind: In allocating funds for maternal and infant care, more money will go to states with higher infant mortality rates. The implicit financial incentive is quite morbid, to say the least.

Funds to combat drug and alcohol addiction will cease if a state actually succeeds in eradicating drug and alcohol addiction. During the war on poverty funds were reduced if the incidence of poverty increased as a result of a community action program. Later it was discovered that successful programs tended to attract the poor from near and far, this in turn increased poverty incidence, and the successful program was cut.

Throughout our economy we penalize welfare recipients who earn income from work, we increase police budgets when the crime rate goes up, we pour more money into education when illiteracy rates go up, and we do not realize what we have created until the health care industry becomes very costly, welfare recipients drop out of the economic system, crime spreads throughout our cities and education deteriorates by all accepted national measures.

The underlying incentive system is a key factor in creating and sustaining cost increases.

To combat the effects of this sytem, we create patchwork measures such as PSROs, economic stabilization programs, certificate of need, 9% cost ceilings, P.L. 93-641 (National Health Planning and Resources Act of 1974), peer review, prospective reimbursement, retrospective reimbursement and other mechanisms to cope with the undesirable side effects of the underlying system.

It is never enough to improve one component of a system. More often than not this only puts that component at odds with the overall system, and the other components will overpower the changed components. Change, in order to be lasting, must be system wide. Controlling costs in only one part of the system, e.g. hospitals, creates imbalances and system distortions which in turn must be identified and controlled.

The Health Care System

The health care system is a complex set of interacting components. In 1973 a macrostatistical model of the health sector for the State of Minnesota was developed by the author and Mr. Gestur Davidson. The model consisted of a series of equations identifying the demand for inpatient and outpatient services, the supply of these same services, and the resulting, derived demand for health manpower. Through computer simulation techniques, changes were made in variables like insurance coverage and hospital beds, and their impact on all other variables were studied. Forecasting these results for 1975 and 1980 made it possible to study long term effects on health care sector costs, patient flow, manpower demands, outpatient care, and all other variables of interest. Only through the use of similar, complex models does it become possible to assess the quantitative impacts of actions taken to change or improve health sector functioning.

The lessons from the Minnesota model clearly indicated that all components were closely interrelated. Changes in per diem hospital costs were related to the demand for outpatient care. Vacant beds increased demand for hospital care. Demand for nursing home care depended on the cost of boarding home care. Actions taken in one component of the health sector reverberated through the other components and often created unexpected and interesting results. Clearly these results indicated that no change or improvement ever happened in isolation, and that contemplated changes should be evaluated very carefully for their effects on other components of the system.

The model did provide information about what exactly influenced hospital per diem costs, the cost of outpatient visits, the cost of nursing home care, the cost of boarding home care. Indirectly, it then becomes possible to isolate the variables that most affect these costs, and try to influence these in the desired direction. It even becomes possible to concentrate on tertiary variables, which in turn significantly affect the variables that affect cost. The recommendations of this committee may indeed direct themselves to areas of such secondary or tertiary effects, in order to affect cost in the desired direction.

Health Sector Behavior

The strong demand for health care, coupled with the presence of an accommodating incentive system, made it possible for the health sector to double its share of the GNP over a relatively short period of time. This increased share was apportioned between price increases (50%), services to a large population (19%), and new and/or expanded services (31%).

It is most difficult to justify calculations of this kind, since the health sector is continuously changing, and a visit or a hospital day in 1950 is fundamentally different from a visit or a hospital day in 1977. However, a number of specific hypotheses about the behavior of the health sector have been examined by investigators, and the results are given below.

(a) Is Technology Reducing Costs?

No. It is generally not labor saving, and usually represents quality improvements and new procedures that increase costs. Whatever reductions in cost may occur through new blood analyzing techniques are usually more than offset by an increase in the number of tests ordered.

(b) Has the Mixture of Hospital Staff Been Upgraded, and Hence Increased Costs?

No. The relative skill mixture of hospital employees has been reduced.

(c) Has the Increase in the Federal Minimum Wage Had a Significant Effect on Cost?

No. The effect on per diem cost of minimum wage increases is minimal.

(d) Has the Increase in Unionization Increased Hospital Costs?

No. Between 1961 and 1967 unionization increased only from 3.2% to 6.8%.

(e) Has Staff Expansion Increased Cost?

Yes. Expansion from 5.0 per 1,000 population to 8.6 in 1968 increased cost not only by the numbers indicated, but also by the wage increases that were necessary in order to attract new personnel from other professions.

(f) Has the Health Sector Engaged in Philanthropic Wage Setting?

Interns have increased their wages from $240.00 in 1951 (Massachusetts General Hospital) to $7,500.00 in 1970. Such an increase is not necessary to attract applicants, and may be considered a philanthropic gesture.

(g) Has the Health Sector Exercised Monopoly Control?

In studying the pattern of wage increases, it can be shown that the health sector has tended to increase wages of people more who are *not* employable elsewhere. In 1969 it was deomonstrated that hospital employees received higher wages than comparable employees in industry.

(h) What Seems to Affect Decisions on Hospital Cost Increases?

Hospitals seem to be inclined towards improving elements that enhance the well-being of the employees, such as salary, prestige, security, power and professional satisfaction. The prestige and status of the organizations themselves are important factors. Status is an abstract concept that derives from judgments passed on a hospital. Since such judgments are concerned with the hospital as a producer of care, they are usually based on visible objects. Thus attention of hospital staffs has been focused on the variety, quantity and complexity of *inputs* available in the hospital. Thus the status of a hospital is directly related to the range of services available and the extent to which expensive and highly specialized equipment and personnel are available.

The most important input is the physician, both because of his reputation, and because of the fact that he brings in patients. In order to bring in patients, hospitals are very sensitive to the demands of their medical staffs. Since hospitals serve as free workshops to physicians, the better and more fully equipped a hospital is, the greater the rewards to the physician. Hence competition among hospitals for physicians often results in expansion and improvement of hospital accoutrements—the price paid in part to be able to attract physicians.

The consequence of these behaviors is that hospitals tend to acquire instrumentation and equipment that may not be defensible according to strict investments and cost criteria.

How Has It Been Possible to Finance Such a Strategy?

Since the health sector is generally viewed as a non-profit sector, it enjoys great public confidence. The impersonalization of payment practices through insurance has the effect of relieving consumers of the direct magnitude of hospital cost increases. Hospitals themselves feel that third parties, rather than consumers are paying the bills, and therefore they have found it relatively easy to pass through cost increases. Third party review has generally been limited to ascertaining whether the expenses reported had in fact been incurred, rather than questioning the propriety of the expenses. The practice of average cost pricing, where losses incurred on certain services are recovered through higher charges on other services, tends to decrease efficiency and raises questions of equity in patient billings. The total outcome is likely to produce duplication, underutilized equipment and overhiring of staff.

What Has Been the Positive Effects of This Policy?

The United States enjoy the most modern, highly developed and capacious health care delivery sector in the world. Americans can expect to live longer than before, survive disease and accidents with higher probability than ever before. The number of health care specialists has increased from 40 to over 150 between 1950 and 1974, hence making advanced tertiary care possible.

Is Regulation the Answer to Controlling Hospital Costs?

Cost and price regulation in some form has been attempted in recent years. The economic stabilization program introduced by President Nixon remained in effect until 1974. Hospital cost commissions have tried various regulatory schemes in a number of states. Prospective reimbursement has been tested by Blue Cross/Blue Shield Plans, together with voluntary controls. Medicare and Medicaid have introduced a number of restrictions on allowable costs.

Regulation tends to be of two kinds: (a) An absolute lid on price increases, and (b) A combination of regulations and incentives intended to shape behaviors and practices that affect cost.

The problem of price control is that it only affects unit cost; it does not affect the amount of services, and hence may have little impact on total cost. Studies have shown that as much as a 50% reduction in annual price increases can be accomplished, but that increased intensity of services utilization (clinical lab tests, e.g.) can offset the price reduction so that total cost may increase as much as before. However, studies have indicated that during the economic stabilization program a substantial fraction of hospitals elected not to implement a price increase that had to go through the exceptions process (although this may be due to the estimation of the expected life of the ESP), and in some instances laid off employees, shelved capital plans and improved operating procedures. The economic stabilization program did not last long enough to provide definitive data on the value of such controls, however.

Prospective reimbursement has been credited with reductions in the rate of price increase, whether in comparison with past performance, or with a control group. But the effect on productivity is ambiguous, and many hospitals have dropped out of prospective reimbursement programs due to excessive red tape.

Reimbursing on the basis of retrospective average cost for comparable hospitals tends to force per diem cost towards the group mean. For those hospitals that must reduce cost, case mixture is frequently significantly changed to facilitate the reduction.

Multivariate prospective reimbursement formulae (Lave has used a 21 variable approach) represents a significant improvement on average cost. However, its complexity and tendency to favor status quo create problems in application.

On the whole, controls have not been shown to be unambiguously effective in slowing or reducing health care costs. In particular, the effect on the total health care sector is often deleterious. If the health sector under control, while inputs to it from other sectors are non-controlled, the outcome is resentment and a sense of unfairness. If only a part of the health sector is subject to control, distortions in care delivery are sure to follow. And finally, there is the cost of the regulatory process itself. A major layer of bureaucratic intervention may be necessary in order to assure a fair and impartial administration of controls, and the cost of this apparatus may exceed the benefits of control. Even if the controls appear to be successful, there is still the problem of assessing whether success was achieved through (a) increase in productivity, (b) decreased or stable unit prices, (c) changes in case mixture, (d) changes in utilization procedures, (e) deterioration in the quality of care.

Focus on Productivity

Productivity consists of three simultaneous auditions existing:

Occupancy

The concept of occupancy can be illustrated by the question:

Are you working, or waiting for work? In the health care field, services not delivered cannot be stored, they are lost forever. As much as five to 10% can be gained by improving the occupancy of current health providers.

Effectiveness

The concept of effectiveness can be illustrated by the question: Are you working on the right thing? Services misdirected are services denied to proper recipients. 15% to 30% is the range of service time that health professionals have identified during productivity studies as being ineffective.

Efficiency

The concept of efficiency can be illustrated by the question: Are you doing the thing right? Services improperly executed account for five to 10% of the total service delivery.

Improving the productivity of health care providers could potentially bring about gains of 25% to 50% in health sector functioning. It has been shown that productivity improvements tend to be accompanied by improvements in job satisfaction and reduction in job stress.

It must be emphasized that for a productivity program to be successful the emphasis must be shifted from services to outcomes. The tendency to focus on inputs rather than outputs is a severe problem in the health care field, and one that is the root of many of the criticisms emanating from the public. The reason is that services are readily accountable, they put the attention on the provider, and they are conceived of as being innately "good". But let us keep in mind that prison rehabilitation programs are favored primarily, because they demand more staff than work release programs, even if the latter are far more effective.

Cash subsidies obviate the need for poverty workers, thus the war on poverty spent most of its resources on staff, rather than on the poor themselves.

Eighteen years of compulsory education employ more teachers than a system based on output evaluation. (It was conclusively shown that large classes at the University of Minnesota taught better than smaller groups!)

Criticism of a sector acceptably focuses on lack of services, rather than on output. Services may be thought to be needed to combat alienation, anomie, loneliness, addiction, fatness, non-assertiveness, lead-poisoning, mal-nutrition, mental illness, social maladjustment, illiteracy, drunken driving, etc. People can always be found suffering one or more afflictions. But is it proper to view services as the solutions? At best, services are inputs, or intermediate steps, the outcome of desired change is what we should focus on, and measure.

Priorities in Health

The LaLonde and the Fogarty Commission reports conclusively showed that most of what we suffer from in the United States and Canada, we have brought upon ourselves. It is what we eat, or drink, or smoke, or do, not exercise that impairs our health and reduces our life expectancies. Life expectancy for age 40 and over has not changed in more than 40 years.

We know that a change in life style or health habits could increase life expectancy by as much as 15 years from birth, or 11 years from the age of 45.

At the same time we know that a cancer cure will increase life expectancy by less than one year.

97.5% of our health care resources are spent on treating the *consequences* of what we have done to ourselves.

Clearly accute care has reached the point of diminishing return.

To some extent we can change the environment through the elimination of toxicants.

We can impose economic sanctions on those that do not wear seat belts, or motorcycle helmets.

We may even outlaw cigarettes, or saccharine, or Pepsi in our pursuit of health care cost reduction. But in the end it will be up to ourselves. It is what we are willing to take individual responsibility for that will affect health care costs in a significant manner.

But what do we do when we are faced with the problem of prevention in its naked horror: The execution of a murderer can be shown, through conventional multivariable techniques, to prevent 17 homicides.

Recommendations

1. We must try to reverse the perverse incentives that pervade the health care sector. The goal must be to improve health, and it is this goal that must be rewarded.
2. We must develop ethics of choice that face up to the problem of whom shall live.
3. We must set up norms for expected outputs, not inputs, so that true accountability and performance assessment can be implemented.
4. We must realize that acute care may have reached the point of diminishing returns, and that our health care resources to an increasing extent must be diverted toward changes in individual behavior, attitude and judgment concerning health.
5. We must let the responsibility for allocating health care resources be shared with the recipients, so that societal perspectives continuously are applied to the health care sector.

This presentation started by pointing out that whatever we do to contain costs, implied that we allocate or reallocate resources, and this in turn has life and death implications. It was pointed out that cost or price increases are just symptoms of underlying causes, and just as in medicine, if we do not address those causes, we have not done the job. It will be your tasks to see beyond the surface problems of cost and price increases, and tailor recommendations that address the fundamental issues in health care.

Like life itself, the health care sector reflects our fears and dreams. It contains hucksters as well as visionaries. It produces innovations as well as shams, breakthroughs as well as fashionable fluff. The lasting and genuine changes have come when we concerned ourselves with the basics; when we treated cause, not symptoms, when we dealt with an individual, not a disease, when we focused on health, not its opposite; when we used hard data and common sense and what we knew was right in our approach to health care.

Therein lies the hope, the promise and the dignity of our efforts. In this manner, you will be able to devise new methods or organization and finance which will make the future development of health care delivery truly responsive to the preferences of our people.

MSMA Annual Socio-Economic Conference

Radisson South Hotel, Bloomington, November 17 & 18, 1977

Thursday, November 17, 1977

10:00 - 12 Noon OPENING GENERAL SESSION

(Veranda Rooms 1-6)

Audio Opening

"Taking the Leadership in Medical Socio-Economics"

"The Long Distance Runner"

Presented by the American Medical Association

Special Guest Address

The Honorable Rudy Perpich, Governor of the State of Minnesota

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A new slide/sound presentation on Minnesota physicians involved in health planning.

Update — Minnesota Health Planning

Vernon L. Sommerdorf, M.D., State Health Coordinating Committee (SHCC) on Health Planning, Presiding

Speakers: John Dilley, State Health Planning & Development Agency; Malcolm Mitchell, Metropolitan Health Board (HSA 5); Tom Galligan, MSMA Department of Health Planning

12:00 - 1:30 Luncheon Session

Speaker: James S. Todd, M.D. — Ridgewood, New Jersey

1:45 - 3:00 HSA Breakout Sessions

HSA #1 Room - Veranda #5
HSA #2 Room - Veranda #6
HSA #3 Room - Veranda #7
HSA #4 Room - Veranda #8
HSA #5 Room - Village #4
HSA #6 Room - Mr. C's (top of Radisson)
HSA #7 Room - Mr. C's (top of Radisson)

GENERAL SESSION

(Great Hall East)

3:15 - 4:30 Medical Competence — The Profession Examines Itself

Michele C. Morley, MSMA Division of Socio-Economic Affairs

Panel: Thomas G. Briggs, M.D., Chairman MSMA Ad Hoc Committee on Medical Discipline,
John S. Welch, M.D., Chairman MSMA Committee on Continuing Medical Education,
Lois Y. Fossum, Director MSMA Department of CME & Program Services, and
William E. Jacott, M.D. Member of Minnesota State Board of Medical Examiners and MSMA Ad Hoc Committee on Medical Discipline

Socio-Economic Conference

(Continued)

4:30 - 5:00 Outside Effects on Your Practice in 1978

Speaker: Martin Van Herik, M.D., Chairman MSMA Committee on Medical Service

6:00 - 7:00 Cocktail Reception

(Cash bars outside Great Hall East)

7:15 - 9:00 Dinner Session

(Great Hall East)

Robert S. Flom, M.D., MSMA President Elect, Presiding

1977 MINNPAC Membership Awards

L. Ashley Whitesell, M.D., Chairman, MINNPAC Board of Directors

Speaker: The Scene in Washington

Mr. Jerome F. Brazda, Editor

Washington Report on Medicine & Health.

Friday, November 18, 1977

7:30 - 8:30 Breakfast with the Socio-Economic Board

Chester A. Anderson, M.D., MSMA President, Presiding

A Forecast of 1978 State Ligislation

Speaker: Senator Nicholas Coleman, Majority Leader, Minnesota Senate

GENERAL SESSION

(Veranda Rooms 5-8)

9:15 - 10:15 Legislative Issues and Strategies for 1978

James H. Sova, MSMA Department of Legislative Affairs, Presiding

Panel: Chairman and members of MSMA Committee on Legislation

10:15 - 11:30 Attacking the Problem of Health Care Costs — A Minnesota Leadership Initiative

Richard J. Frey, M.D., Chairman, MSMA Health Care Cost Commission, Presiding

Speaker: Tor Dahl, Associate Professor, School of Public Health Program in Hospital and Health Care Administration, University of Minnesota and Special Consultant to MSMA Health Care Cost Commission

Registration $25

Please make checks payable: Minnesota State Medical Association, Socio-Economic Conference, 101 East 5th Street Suite 900, St. Paul, MN 55101.

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House of Delegates

The House will convene November 18 and 19 at the Radisson-South, Minneapolis.

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**The Advertising
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President's Letter

Christmas is for Children

Or is it? During this month of festivities and celebration, we oldsters seem to recall the joys of our youth in watching the sparkle, enthusiasm, antics and wonder in the eyes of our children and grandchildren; and rightly so. It is a season of gladness and joy throughout all Christiandom. The tinsel, the tree, the ornaments, the gifts, the feasts, the family gatherings are all there, and I would hope the special church services which are just a gentle reminder that we are celebrating His birth. That is what Christmas is all about!

For most of us, this is the Christmas scene we see through the picture windows of our homes. But what about other homes? Are there happy children and grandchildren in those homes which have been affected by drugs, marijuana, juvenile pornography, and alcohol? Or do we find children with no hope, no joy, no security, and no enthusiasm for tomorrow? For it, too, will be a day of degradation, hallucinations, headaches, and mental and physical sickness.

Most of us, as physicians, are not crusaders. We consider ourselves men of science, men trained to treat the ills of mankind. Seldom do we consider ourselves as people trained to treat the ills of society. May I remind you that the ills of mankind and the ills of society are so interrelated that you cannot treat one without considering the other.

Our modern-day society, in my judgment, has done wonders for the demands of our oldsters. Pension plans, nursing homes, medicare, social security, free fishing licenses, homes for the aged poor, we could go on and on, have been provided for the aged in this country. They, the oldsters, are well-equipped and well-organized, and demand even more.

Who has organized the children? Who is watching out for them in our modern, fast-paced society? The parents? Sometimes! The schools? Sometimes! The churches? Sometimes! The juvenile courts—occasionally! Law enforcement officers? When they get help from the court (which seems to be less and less often). Public health departments, free clinics, detox centers—yes, these are all helpful. But the latter institutions would not have the heavy load with which they are burdened if the former institutions—home, church, school—were doing their jobs. Is this then an indictment of our modern day institutions? Yes, to some extent it must be so. For they, the institutions, are the ones that tolerate the perverts, the pushers, the addicts, the merchants who not only make these things available to our children, but start them out on that pathway as well. Who tolerates the new industry, juvenile pornography, that is spreading like religion throughout this country? All of these are manifestations of a sick society. And we are, by our training, educated to treat the sick!!

You ask, "What are you getting at?" Just that we in the medical profession, must take the leadership in programs to prevent our children—yours, mine, and others—from being lured into these health-damaging habits. "How?" you say. I make these suggestions:

1. It's well known that the T.V. media have cut down the violence programs previously aired on T.V. after the medical profession along with the P.T.A. and other groups objected to the amount of violence being presented. Let us now request that the T.V. media, the recognized strongest influence on our society today, produce programs that portray the evils of these things in such a way that they will not be attractive to children and adolescents.
2. Support legislation that gives authority even more muscle than they now have to clamp down on the adult pushers, perverts, etc.

3. Demand a revamping of our laws so that juveniles who commit adult crimes can be punished with the punishment that fits the crime.
4. Within our own profession, encourage educational programs for our peers to recognize early symptoms of chemical usage in our children and adolescents.
5. Not just be content to treat the ill child who shows up with the symptoms, but cooperate with the authorities in tracking down the causative agent or agents—whoever or whatever that may be.

I full well realize that there are some in the social services who would object to the fifth point, stating that this might keep offenders from seeking treatment. Perhaps they have a point. But the only true way to stamp out the illness is to stamp out the cause, and I am sure as the public becomes better educated, there will be more and more cooperation in this endeavor.

Let us dedicate ourselves to this type of program. At this joyous Christmas time, let us direct our efforts so that *all* children can indeed live in a joyous world where *they can dream dreams* and have the opportunity to have *those dreams come true* as He, whose birthday we celebrate, meant that they should. We must, as physicians, accept the responsibility of attempting to heal this illness of society and its dangerous consequences.

May I and Mrs. Anderson take this opportunity to wish all of you a very Merry Christmas and a prosperous New Year.

CA Anderson MD

C. A. Anderson, M.D.
President

The Season to be Jolly

December is here and another year is just about finished. Somehow, in this season to be jolly we all get quite generous. One hopes that generosity stems from deeply felt charitable impulses. However, it is possible at the same time to acknowledge the practical importance of the tax consequences of giving. In this last month of 1977 we can donate and get tax credit, which makes the gift no less valuable to the cause and considerably more valuable to the taxpaying donor. So, while the spirit of the season is upon you, make your annual gift to the Student Loan Fund of the Foundation of the Minnesota State Medical Association. This will help your income tax return, but help even more the needy student who is the recipient of your generosity. We did it last year; we can do it even better in 1977!

John J. Regan, M.D.
Chairman

The Minnesota State Board of Medical Examiners

Dale Dodson, D. O., Northfield, Minnesota was elected President of the Minnesota State Board of Medical Examiners by the Board at its meeting held on May 13, 1977.

The Board also elected Reverend David McPhee, St. Paul, as the Vice-President, and Loren E. Nelson, M.D., St. Paul, as the Secretary-Treasurer.

The Board welcomes its newest member, Dorothy Bernstein, M.D., Minneapolis who was appointed by Governor Perpich to serve on the Board.

Arthur W. Poore,
Executive Secretary

Editor's Notebook

Notes on Health Care Cost Containment: Management, Politics, and Medicine

"It is all too apparent right now, with the current reimbursement programs and the ubiquitous and often conflicting morass of regulations, that the federal government, instead of being part of the solution, is part of the problem of rising health care cost."

The Complex Puzzle of Rising Health Care Costs,
Council on Wage and Price Stability,
December, 1976

"HEW Secretary Califano, in London to study Britain's national health service, pronounced U.S. hospitals "incredibly obese and profligate". He said he was 'very impressed' with the state-run system."

News release, *Wall Street Journal*, November 17, 1977

From November 6-9, my wife and I attended a seminar "The Contribution of Management to Cost Containment" in Cambridge, Massachusetts. The Harvard School of Public Health gave the seminar for graduates (and spouses) of its six previous six week summer courses on Health Systems Management.

This is a report on the seminar with notes on health care cost containment.

Backdrop

As readers of *MINNESOTA MEDICINE*, you may recall I attended the 1976 Health Systems Management course and wrote three editorials on the experience. [1–3] In those editorials, I concluded: (1) National Health Insurance is at least three to five years away, maybe more, because of costly Medicare and Medicaid programs; (2) skyrocketing health costs will soon force government at all levels to analyze new technology, limit capital expenditures, and regulate hospital operations; (3) Medicine is no longer an isolated profession but one of many interacting organizations that shares society's economic pie; and (4) physicians must become more managerially-minded so they get the right and acceptable things done for society.

What has happened since 1976? Well, even with more regulations, health care costs have shot up 31 percent. Cost containment efforts have taken four forms: (1) disallowance of specified cost items from third reimbursement formula; (2) rate review; (3) regulation of capital expenditures and services, e.g. Certificate-of-need laws; and (4) utilization controls and claims reviews. Yet costs still rise. For this reason, "Health Care Cost Containment" has moved front and center as the central issue of the national health care policy debate. In July 1977, the Carter administration introduced its Hospital Cost Containment Act. The bill has two parts: (1) a $2.5 billion dollar limit on hospital capital expenditures; and (2) a nine percent "cap" on annual hospital expenditures. In concert with the bill, HEW Secretary Califano is conducting a systematic campaign to discredit physicians, (including an error-laden list of physicians who received over $100,000 of federal money), and to denounce ''obese and profligate'' hospitals. The Carter administration views its Cost Containment bill as essential in the transition to the National Health Insurance Bill it promised before the end of Carter's term. Califano's bully boy tactics are apparently part of the softening up process. As you may know, Carter's bill did not come out of committee this year, but the bill no doubt will resurface in 1978.

Management

Because regulatory cost containment efforts have proven so ineffective, management has been drawn into controlling costs. For many large companies, including General Motors, Blue Cross-Blue Shield is their single biggest supplier. So managers are becoming increasingly active on Blue Cross-Blue Shield boards, in the nation's 212 Health Service Area boards, and on Cost Commissions.

But how will managers, traditionally free-enterprise oriented but now with profits threatened by health insurance payments, react? One way of approaching that question is to share my notes with you from the Harvard seminar, for most of the participants there were managers from within and outside the health care field. Before I go much further, I should say the Harvard method is to teach by analyzing real-life cases, then to bring out the essentials of cases by Socratic questioning.

Seminar Notes

Introductory Talk, ''Perspectives in Health Cost Containment'', by Eoin Trevelyan, Lecturer in Management at Harvard School of Public Health:

Management's role should be to decrease inflation, decrease percent of GNP (now 8.6%), and to decrease total expenditures. Compared to U.S. economy's other sectors from 1972-75, health care didn't perform badly — health services, up 41%; food, up 40%; legal fees, up 50%; automobiles, up 46%; magazines, up, 62%. In terms of yearly inflation compared to yearly increases in corporate revenues, health industry didn't do badly either: health industry 12-13%, Fortune 500 companies 14%, Hospital Corporation of America 29%, American Medicor Corporation 19%, American Hospital Supply 17%, Baxter's Travenol 23%, Johnson and Johnson Corporation 17%, Kaiser Permanent Health Plans 19%. So what's the big deal? Big deal is government pays bigger and growing part of health bill. Government's share is now 45% and will go to 70%, Labor, management, and media now all talking about reducing health costs. Costs are hard to analyze because existing main criterion for tracking cost, ''patient day,'' is invalid. Average patient days were down from 1971-75 from 8.2 to 7.7, and average occupancy dropped from 78% to 75%. But there was 75% increase in labor, procedure, and people ''inputs/patient day.'' ''Patient-days'' is wrong way to judge costs; diseases by diagnostic category probably a more useful criteria to follow. In any case, one cannot contain costs unless one can measure what one is containing. More sophisticated and balanced analyses are essential to get handle on costs. No matter what is done, no quick fix is possible.

Case 1, Blue Shield of Massachusett's Utilization Review Program

Blue Cross and Blue Shield of Massachusetts paid $1.4 billion of benefits in 1976 and processed 15 million claims. Blue Shield markets its services to physicians through a newsletter. Latest newsletter announced a utilization program had yielded 59 cases for review, including 15 cases of possible fraud. Most participants were not impressed by yield of Review Program, but conceded the newsletter might serve as a warning beacon.

Case 2, Massachusetts Eye and Ear Infirmary

Recently this institution introduced: (1) an admission charge ($182); (2) a routine daily charge for room and board ($39); and (3) clinical care units ($4.71). Units were based on information from a nursing journal. (4) One unit would be seven and a half minutes of nursing time; two units, 15 minutes, and so forth. Split accounting system did not have much impact on overall revenues of nursing care. Essentially a measure of "intensity." Seminar participants considered new system innovative, but doubted if it could be applied to general hospitals.

Case 3, Johns Hopkins Reorganization

In 1972-1973, Johns Hopkins decentralized its managerial structure to cut its losses. In 1972, Hopkins lost $3.1 million in its outpatient departments, largely because it could not collect bills from poor. New Hopkins Director decentralized medical center into 14 departments and gave Chiefs of Service both academic and financial control of their departments. The Director gave Chiefs administrative support and told them they could keep money they earned or saved for departmental purposes. Strategy worked. By 1976, Hopkins had turned corner and was in black. Better financial picture came at sacrifice of many outpatient services, and it changed nature of Chief's jobs. Lecturer concluded these changes were necessary: to change strategy (i.e. to cut costs), you must change structure.

Case 4, Oakland Community Hospital

This 329 bed suburban Detroit hospital had a tough time controlling labor costs. This case boiled down to how to pick criteria and standards to judge whether you are overstaffed or understaffed. Many hospitals do this by comparing themselves to other hospitals with data from an organization known as Hospital Administrative Services (HAS).

Case 5, Tale of Two Counties

This case compared two medical systems in adjacent Indiana counties — one sophisticated and the seat of Indiana University, the other a growing rural area. Comparison was seen through eyes of electronic firm executive, who was trying to cut his firm's health care expenses by seeking alternative forms of care. He considered existing system, HMOs, controlled fee-for-service, Individual Practice Associations (IPA).

Case 6, Hunterdon Medical Center

In 1940, business leaders in Hunterdon County, in rural New Jersey, conceived and built a medical center that stressed an integrated health care delivery system based on closed group of salaried hospital-based staff specialists with open staff of fee-for-service family practice physicians. System worked and was competitive in costs with Permamente. Hospital rates per 1000 were low (99 vs. 144 for New Jersey vs. 157 for U.S.). Yet in 1977 Hunterdon Medical Center was going broke because New Jersey Cost Commission would not reimburse Hunterdon Hospital's high per diem rate. Hunterdon's officials were trying to work out a capitation rate that would reflect overall efficiency of health plan yet one which New Jersey officials would accept.

Purpose

Why have I bothered you with details of the introductory talk and with details of six cases? Mainly to show you the problems managers face and the workings of the managerial mind, with which we, as physicians, will soon work more. Management stresses responsibility, performance, and eliminating uncertainty. A yearly inflation rate of 15-16% is a highly uncertain situation. Management theory rests on seven principles: (1) scientifically managing work; (2) decentralization as a basic principle; (3) managing personnel in an orderly way to fit them into the organization; (4) developing managers to handle future problems; (5) managerial accounting, i.e. use of analysis and information to reach decisions; (6) marketing; and (7) planning to minimize uncertainty. Each of the six cases illustrated at least one of these principles.

Politics

But what intrigued me more about the seminar was not principles of management — but the political mood. Two examples of this mood may help.

One of the participants was an administrator for a regional HEW office. She was taken back how many of the participants now talked disdainfully of "bureaucrats." "Why, four years ago," she said, "they loved me."

Then, during the last part of the seminar, an HEW representative, up from Washington for the occasion, was asked why the Carter administration did not include Veteran Administration Hospitals under his Cost Containment bill. When the HEW man cavalierly brushed off the question by saying: "Too politically sensitive," he was hooted down.

I have cited these examples because I think they illustrate a few of the Carter Administration's problems with health legislature.

First, there is the credibility problem. The Administration has swung a meat ax at private voluntary hospitals, yet it blithely ignores the 171 Veteran's hospitals and other federal hospitals. These hospitals have roughly twice the per diem costs and twice the hospital stay as private hospitals.

Second, there is the priority problem. In the health field, as elsewhere, the Carter administration is attacking on all bureaucratic fronts while simultaneously proclaiming it is pruning bureaucracy. The Administration also has a habit of backing down, as with the $50 rebate, when it encounters tough going. In many instances, this dualistic behavior confuses Carter's backers and disillusions professional bureaucrats.

Third, there is the historical ignorance problem. The Administration misunderstands the evolution of medicine in this country and underestimates the strengths and skills of the private sector. The United States is not Sweden or England. In Sweden, the government has had responsibility for health services for 300 years, owns its hospitals, and generally pays its physicians' salaries. In England, the government took over ownership of hospitals after the devastation of World War II. England had no established private health insurance industry, and with low private incomes and army salaries of its physicians in World War II, found it easy to make the transition to salaried specialists and capitation-payment for general physicians. In the United States, on the other hand, we have a large private insurance industry that has been financing health care for as long as 40 years. We have vigorous independent physicians whose technical and diagnostic skills are unsurpassed. We have disciplined, well-educated hospital administrators who command physician and community respect. And we have a tradition of deep distrust of government enterprise.

Fourth, there is the ''demand-forgetfulness'' syndrome. Now that the government wants to cut down the supply of hospital services, it forgets it created the demand in the first place — through Hill-Burton funds, Medicare and Medicaid, and last, but not least, doubling the number of physician graduates these last ten years. This convenient syndrome particularly angers hospital administraters, who must serve as hatchet men for the government's meat ax approach.

Fifth, there is the hospital constituency problem. Hospitals represent two large constituencies: (1) hospital employees, now the second or third largest work-force in the United States; (2) patients and citizens in the communities. The administration will counter resistance from both if it goes ahead and closes 20 percent of hospital beds. Chances are, Carter will have about as much luck as did Lyndon Johnson, who failed to shut down 16 marginal VA hospitals about 10 years ago.

Physicians

This brings me to the physicians. If government regulatory efforts fail to contain costs, and they are failing, and if management's efforts are just taking hold, who shall do the job? And it is a job that public and private representatives, both liberal and conservative, agree needs to be done.

In Minnesota, our answer is: physicians should take the initiative. Minnesota is known as a State of clean air, clean water, clean government, public accountability, and compromise between the public and private sectors. Indeed, the ''Minnesota Miracle,'' our balanced bright economic picture, rests on cooperative efforts between these two sectors.

In May, 1977, the Minnesota State Medical Association announced it had formed a Commission on Health Care Costs. The Commission, which has now met four times, is made up of 21 members* from medicine, hospitals, government, insurance, labor, economics, business, industry, and allied health organizations. Dr. Richard J. Frey, Chairman of the Council of the Minnesota State Medical Association, chairs the Commission.[5]

The Commission's job will be: (1) to define health care systems in Minnesota, (2) to identify forces that increase costs; (3) to evaluate existing research and do research of its own to identify problems of health inflation; (4) to review those health organizations outside of fee-for-service and to comment on their performance; and (5) to recommend a course to contain costs but provide good care for the public. This Commission will meet for 18 months and then issue a report that the Association will not edit, even if it differs from the Association's position.

So far the Commission has been active. Four task forces are studying the Demand, Supply, Market place and Technology aspects of the Health Care equation.

Two reports of presentations before the Commission have appeared in *MINNESOTA MEDICINE*: (1) "Analyzing the Cost of Health Care," by Tor Dahl, November issue, pages 839-846, 1977, and (2) "A Legislator's View of Health Expenditures" by Senator John Milton, December issue, page 889, 1977. More presentations will be published. In addition, the Association has commissioned a 70-page analysis by Doctor Tor Dahl, Associate Professor of Hospital and Health Care Administration at the University, of health systems in Minnesota. His analysis is not yet out, but I understand he has found Minnesota has a more pluralistic, experimental approach to health than most other parts of the United States. In any event, in Minnesota we know no one segment of society can contain health care costs alone. Only through a concentrated, cooperative approach by medicine and hospital professionals, and the consumer, labor, management, insurers, and the government can we do the job.

Richard L Reece MD

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*See page 859.

References

1. Reece, RL: View from Boston. Minnesota Med 59:513, 1976.
2. IBID: Medicine in transition. Minnesota Med 59:593, 1976.
3. IBID: Medical leadership and social responsibility. Minnesota Med 59:671, 1976.
4. Poland, M, et al: PETO — a system for assisting and meeting patient care needs. Am J Nursing 70:1479, 1970.
5. Frey, Richard J: Health care cost commission. Minnesota Med 60:563, 1977.

Members of the Commission

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Interstudy, Excelsior

Earl Dresser, President
Methodist Hospital, St. Louis Park

James Bormann
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Continuing Medical Education

University of Minnesota

Diagnosis and Evaluation of Pain Problems—December 9-10, 1977. Sheraton-Ritz Hotel, 315 Nicollet Avenue, Minneapolis, Minnesota, FEE: $85.00.

Although many pain problems are readily resolved, they may progress to chronic and even disabling stages. Physicians need to spot ‘‘red-flag’’ syndromes, and do careful assessments to prevent disabling consequences. New treatment modalities touted by some ‘‘pain centers’’ should be kept in perspective. Contact: Department of CME, University of Minnesota, Box 293, Mayo Building, Minneapolis 55455.

Minnesota Urological Society

Pyelogram Conference, January 20, L’hotel Sofitel, Minneapolis, 6:30 p.m. Contact: Helen Chanak, Secretary, 3625 West 65th St., Suite 120, Minneapolis 55435.

Preceptorship in Pediatrics—Dates and Credit hours arranged

Pediatricians and family physicans who prefer to learn in a teaching hospital environment may select from a wide range of clinical content available through the department and participating teaching hospitals. The range of topics includes infectious disease and immunology, ambulatory pediatrics, pulmonary disease, medical genetics, cardiology, hematology-oncology, endocrine-metabolism, and neonatology. A few days to one or more weeks of study can be arranged to include clinics, rounds, conferences, the Learning Resource Center, and guided readings. For further information regarding these offerings, contact the University of Minnesota, Department of Pediatrics, Box 391 Mayo Memorial Building, 420 Delaware Street S.E.,Minneapolis, Minnesota,55455 or call (612) 373-8114.

Minneapolis Radiological Society

Winter Meeting February 11, 1 p.m., Sheraton Ritz Hotel, Minneapolis. Fourth Annual K.W. Stenstrom Memorial Lecture. Contact Dennis Campbell, M.D., Fairview Hospital, Minneapolis.

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Constant Intravenous Insulin Infusion

During Labor and Delivery in Diabetes Mellitus

ROBERT H. CAPLAN, M.D., F.A.C.P.;* DIANE BARHITE, R.N., M.N.C.;* and
EVERETT BEGUIN, M.D., F.A.C.O.G., F.A.C.S.*

We treated a gestational and two insulin-requiring diabetic patients with a constant infusion (two units per hour) of crystalline zinc insulin during labor and delivery. Maternal plasma glucose concentrations were maintained between 64 and 104 mg per 100 ml in all patients. Hypoglycemia did not develop in either the mothers or infants. The simplicity and flexibility of this regimen warrants further study.

METICULOUS CONTROL of maternal plasma glucose during labor and delivery is essential if hypoglycemia in an infant of a diabetic mother is to be prevented[1]. Traditionally, the mother is treated with reduced doses of subcutaneous Lente or Isophane (NPH) insulin[2] and/or crystalline zinc insulin[3], or crystalline zinc insulin is added to glucose-containing replacement fluids[4]. These therapeutic approaches do not have the flexibility to maintain fastidious control of maternal blood sugar during labor without the risk of maternal hypoglycemia after delivery.

Several investigators[5-8] have recently published excellent results in the treatment of diabetic ketoacidosis with continuous low-dose insulin infusion. We report, here, the results of a modification of this treatment program used during labor and delivery in one gestational and two insulin-requiring diabetic patients.

Case Reports

Case 1.

A 24-year-old gravida 1, para 0, had an abnormal oral glucose tolerance test while taking oral contraceptives. In the latter part of pregnancy, fasting plasma glucose determinations ranged between 106 and 132 mg per 100 ml (normal range, 65-110 mg per 100 ml) and the 2-hour postprandial plasma glucose levels ranged between 113 and 157 mg per 100 ml (normal range, 65-140 mg per 100 ml). We did not treat the patient with insulin but planned an early delivery.

The patient was admitted to the La Crosse Lutheran Hospital at 39 weeks gestation. She underwent a two-day induction (eight hours daily) and delivered a female infant on the second day. The newborn weighed 3560 Gm. Apgar scores at one and five minutes were eight and nine, respectively. Plasma glucose determined by the Dextrostix® method varied from 45 to 100 mg per 100 ml during the first 24-hours of life.

Case 2

A 20-year-old gravida 1 para 0, Class D juvenile diabetic was first seen at 8 weeks gestation. Adequate control of her plasma glucose concentration was difficult until the third trimester. She was admitted to the hospital at 32 weeks gestation because of the development of retinal hemorrhages, albuminuria (2.9 Gm per 24 hours), and a urinary tract infection. At that time the patient was treated with a 1900 calorie American Diabetes Association (ADA) diet and 117 units of Isophane and 35 units of crystalline zinc insulin every morning and 54 units of Isophane insulin at suppertime.

The urinary tract infection abated with Ampicillin® therapy and the albuminuria decreased significantly with bedrest. An amniocentesis at 36 weeks gestation revealed a lecithin/sphingomyelin (L/S) ratio of 2.12 and creatinine of 2.6 mg per 100 ml (maternal serum creatinine, 0.9 mg per 100 ml).

After two unsuccessful trials of oxytocin (Pitocin®) induction on consecutive days, the patient underwent Cesarean section. The newborn weighed 3,080 Gm. The Apgar score at one minute was nine and at five minutes was 10. The neonatal plasma glucose obtained at three, six, and 12 hours was 45, 59 and 53 mg per 100 ml, respectively. The infant did not develop hypoglycemia or hypocalcemia and was well throughout the hospitalization.

Case 3

A 42-year-old gravida 4, para 3, markedly obese Class B diabetic initially responded poorly to Isophane insulin. Excellent control of her plasma glucose was subsequently achieved with fasting glucose concentrations ranging from 98-120 mg per 100 ml and 4:00 p.m. glucose concentrations ranging from 108-136 mg per 100 ml. She was admitted to the hospital one week prior to induction of labor. On

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*High Risk Clinic, Departments of Internal Medicine and Maternal and Fetal Medicine, Gundersen Clinic, Ltd. and La Crosse Lutheran Hospital, La Crosse, Wisconsin.

Presented at the Annual Meeting of the Wisconsin Society of Obstetrics and Gynecology, Cable, Wisconsin, July 31, 1976.

Address reprints to Robert H. Caplan, M.D., 1836 South Avenue, La Crosse, Wisconsin 54601.

admission an amniocentesis was performed and revealed an L/S ratio of 3.5 and a creatinine of 1.9 mg per 100 ml (maternal serum creatinine, 0.7 mg per 100 ml). During the 37th week of gestation the patient was induced with Pitocin®. The following day, after repeat stimulation, she was delivered by primary Cesarean section because of failure to progress. She delivered a 4540 Gm male infant. Apgar scores at one and five minutes were nine. The neonate's plasma glucose ranged from 42 to 100 mg per 100 ml over the next 18 hours. The postpartum course was uneventful for both mother and infant.

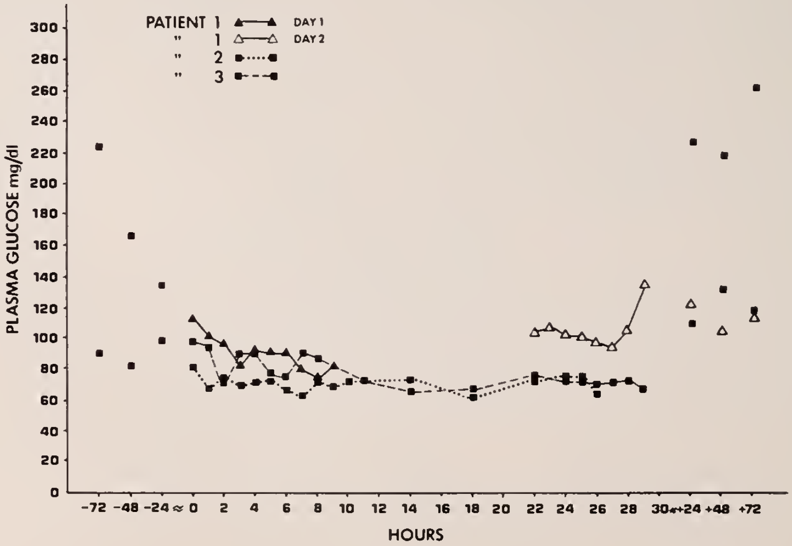
Materials and Methods

We and a dietician interviewed and examined all patients in the High Risk Obstetrical Clinic once weekly. The diabetes was monitored by determining urinary glucose and ketones four times daily and measuring at least one fasting and 4 p.m. plasma glucose concentration weekly. We monitored the pregnancy by the standard use of ultrasonography, oxytocin challenge tests, urinary estriols, and amniocentesis.

On the day of induction, breakfast and the patient's usual insulin injection were omitted. An infusion of 5 per cent dextrose in lactated Ringer's solution was started in a peripheral vein. 50 units of crystalline zinc insulin were added to 500 ml of 0.9 per cent saline. After mixing, the infusate was connected to a pediatric infusion set. The first 50 ml was allowed to run through the infusion tubing and was discarded. The insulin solution, containing 0.1 units of crystalline zinc insulin per ml, was then administered with an IVAC® infusion pump at a rate of 20 ml per hour (two units per hour) in a second peripheral vein. Blood was drawn from a peripheral vein distal from the infusion sites and analyzed for plasma glucose by the glucose oxidase method utilizing a Beckman glucose analyzer. We infused the glucose containing replacement fluid at a rate of 50-100 ml per hour to maintain a plasma glucose of 65-100 mg per 100 ml. At the time of delivery, the insulin infusion was discontinued. Intermediate insulin therapy was reinstituted when the plasma glucose became elevated.

Discussion

Crystalline zinc insulin infused intravenously during labor and delivery at a rate of two units per hour maintained maternal blood glucose concentrations between 64 and 104 mg per 100 ml. In a gestational diabetic patient, plasma glucose concentrations determined on the day of insulin infusion were lower than the following day when the insulin infusion was omitted (Figure). The same rate of insulin infusion was very effective in two diabetic patients who required large amounts of insulin for diabetic control during their pregnancies (Figure). Maintenance fluids consisting of 5 per cent dextrose in lactated Ringer's solution were administered in an infusion separate from the insulin. We adjusted the rate of glucose infusion to 50-100 ml per hour depending on plasma glucose concentrations. Hypoglycemia did not occur in either



Figure—Plasma glucose concentrations during constant insulin infusion in labor and delivery. Insulin was not infused on day two in patient one. Single values to the left and right of the figure represent fasting glucose concentrations 72, 48, and 24 hours before the insulin infusion and approximately 24, 48, and 72 hours after delivery.

the mothers or infants. Although plasma glucose determinations were very stable during the insulin infusion, we recommend plasma glucose determinations every two hours until more experience with low-dose continuous insulin infusion in labor and delivery is accumulated. Almost immediately after delivery, insulin requirements fell dramatically and the insulin infusion was discontinued. Intermediate insulin was reinstituted when plasma glucose concentration became elevated and the patient was able to eat.

Currently there are several recommendations for the treatment of diabetic women during labor and delivery. One utilizes intermediate insulin injected subcutaneously in a dose one-third to one-half the pre-pregnancy dose[2]. Another utilizes multiple doses of crystalline zinc insulin injected subcutaneously[3]. Because of the variability and slowness of absorption and a long half-life, large depots of insulin are created which may result in maternal hypoglycemia after delivery when insulin requirements are drastically reduced. Furthermore, subcutaneous insulin lacks the flexibility to allow rapid lowering of plasma glucose concentration. The addition of insulin to glucose-containing solutions[4] does not allow a change in the rate of insulin infusion without a similar change in the rate of glucose administration.

Initial methods utilizing continuous intravenous infusion of insulin for the treatment of diabetic coma involved the addition of serum albumin to the infusate to prevent absorption to glass and plastic tubing and the use of infusion pumps. A recent study[9], however, indicates that an infusion system utilizing a 50 ml "washout" with a solution of insulin in 0.9 per cent saline permits effective and constant delivery of insulin without the addition of albumin. Although we utilized an infusion pump, other investigators indicate that a pediatric infusion set alone is adequate for delivery of insulin used for the treatment of ketoacidosis[7].

Recent observations[5-8] suggest that small doses of insulin—2.4 to 8.0 units per hour—may be sufficient for the treatment of diabetic ketoacidosis. Such infusion rates simulate systemic venous plasma insulin concentration (20-200 μU per ml) at which insulin has its maximum effect on glucose transport in normal subjects[10]. Glucose utilization and inhibition of lipolysis in adipose tissue require insulin binding receptors located on cell membranes[11]. Insulin-binding capacity of these receptors is finite and after saturation no further effect is expected by increasing the serum insulin above the saturation concentration. Because in vitro glucose utilization and inhibition of lipolysis in isolated adipose cell preparations are saturated at insulin concentrations of approximately 40 μU per ml and 10 μU per ml, respectively[12], increased serum concentration above 40-80 μU per ml is unlikely to have further biologic effect. Based on these considerations, we chose an infusion rate of 2 units per hour. This rate of infusion appears adequate to control plasma glucose within normal limits during labor and delivery and if discontinued at delivery has not produced maternal hypoglycemia.

Gestational, as well as insulin-dependent diabetes mellitus in mothers, results in fetal hyperglycemia and hypertrophy of the fetal pancreatic islets[13]. Separation of the placenta interrupts the passage of maternal glucose into the neonate without a proportional decrease in fetal insulin concentration thus producing abnormally low glucose concentrations in 50% and clinical hypoglycemia of 10-20% of infants of diabetic mothers. Although deficient epinephrine and glucagon responses have been demonstrated, fetal hyperinsulinism is probably the principal cause of the hypoglycemia[13]. Regardless of the pathophysiology, early neonatal glucose homeostasis depends on the cord blood glucose level[1]. Thus, the meticulous control of maternal and cord blood glucose made possible by constant low-dose insulin infusion should reduce the incidence of hypoglycemia in the infant of diabetic mothers.

Although the results of treatment with continuous low-dose insulin infusion in three diabetic women during labor and delivery are preliminary, the technique shows promise. Certainly the simplicity and flexibility of this regimen warrants further investigation.

Acknowledgments

This study was supported by a grant from the Adolf Gundersen Medical Foundation. We gratefully express our appreciation to Kathy Troyanek for the medical illustration and Joan Wiste for secretarial assistance.

References

1. Light, IJ, Keenan, WJ, and Sutherland, JM: Maternal intravenous glucose administration as a cause of hypoglycemia in the infant of the diabetic mother. Am J Obstet Gynecol 113:345, 1972.
2. White, P: Pregnancy and diabetes in Joslin's Diabetes Mellitus. Marble, A., White, P., Bradley, R.F., and Krall, L.P. (eds). Philadelphia, Lea and Febiger, pp 592, 1971.
3. Essex, NL, Pyke, DA, Watkins, PJ, et al.: Diabetic pregnancy. Brit Med J 4:89, 1973.
4. Tyson, JE: Obstetrical management of the pregnant diabetic. Med Clin North Am 55:961, 1971
5. Genuth, SM: Constant intravenous insulin infusion in diabetic ketoacidosis. JAMA 223:1348, 1973.

6-13. Will be found on page 884.

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(Continued to page 887.)

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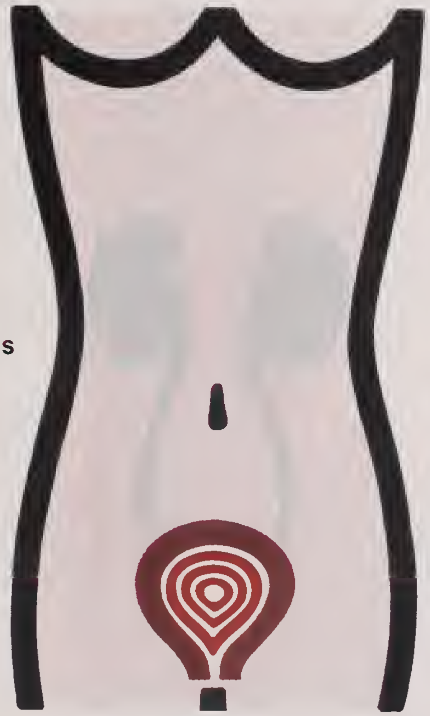

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arnings: Safety during pregnancy not established. Deaths from ypersensitivity reactions, agranulocytosis, aplastic anemia and other lood dyscrasias have been reported and early clinical signs (sore roat, fever, pallor, purpura or jaundice) may indicate serious blood isorders. Frequent CBC and urinalysis with microscopic examation are recommended during sulfonamide therapy.

recautions: Use cautiously in patients with impaired renal or epatic function, severe allergy, bronchial asthma; in glucose-6-hosphate dehydrogenase-deficient individuals in whom dose-elated hemolysis may occur. Maintain adequate fluid intake to revent crystalluria and stone formation.

dverse Reactions: *Blood dyscrasias* (agranulocytosis, aplastic anenia, thrombocytopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia); *allergic reactions* (erythema multiforme, skin eruptions, Stevens-Johnson syndrome, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis); *G.I. reactions* (nausea, emesis, abdominal pains, hepatitis, diarrhea, anorexia, pancreatitis and stomatitis); *CNS reactions* (headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo and insomnia); *miscellaneous reactions* (drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon). Due to certain chemical similarities with some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia. Cross-sensitivity with these agents may exist.

Dosage: Azo Gantanol is intended for the acute, painful phase of urinary tract infections. *Usual adult dosage:* 2 Gm (4 tabs) initially, then 1 Gm (2 tabs) B.I.D. for up to 3 days. If pain persists, causes other than infection should be sought. After relief of pain has been obtained, continued treatment with Gantanol (sulfamethoxazole) may be considered.

Note: Patients should be told that the orange-red dye (phenazopyridine HCl) will color the urine.

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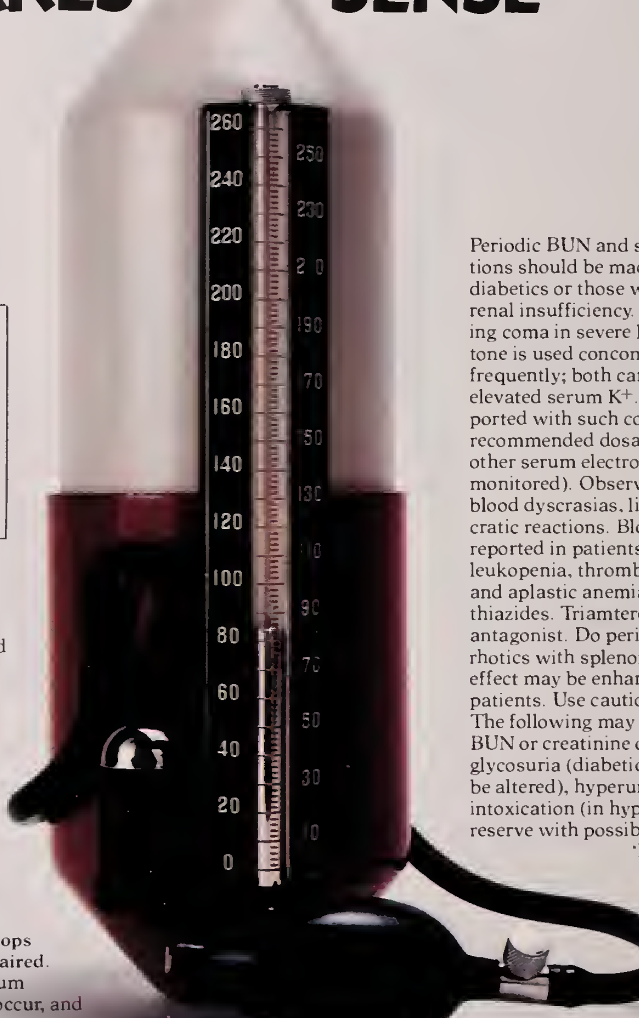

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* **Warning**
This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* **Indications:** When the combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium sparing action of triamterene is warranted. (See Box Warning.) Routine use of diuretics in healthy pregnant women is inappropriate; they are indicated in pregnancy only when edema is due to pathological causes.

Contraindications: Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis.

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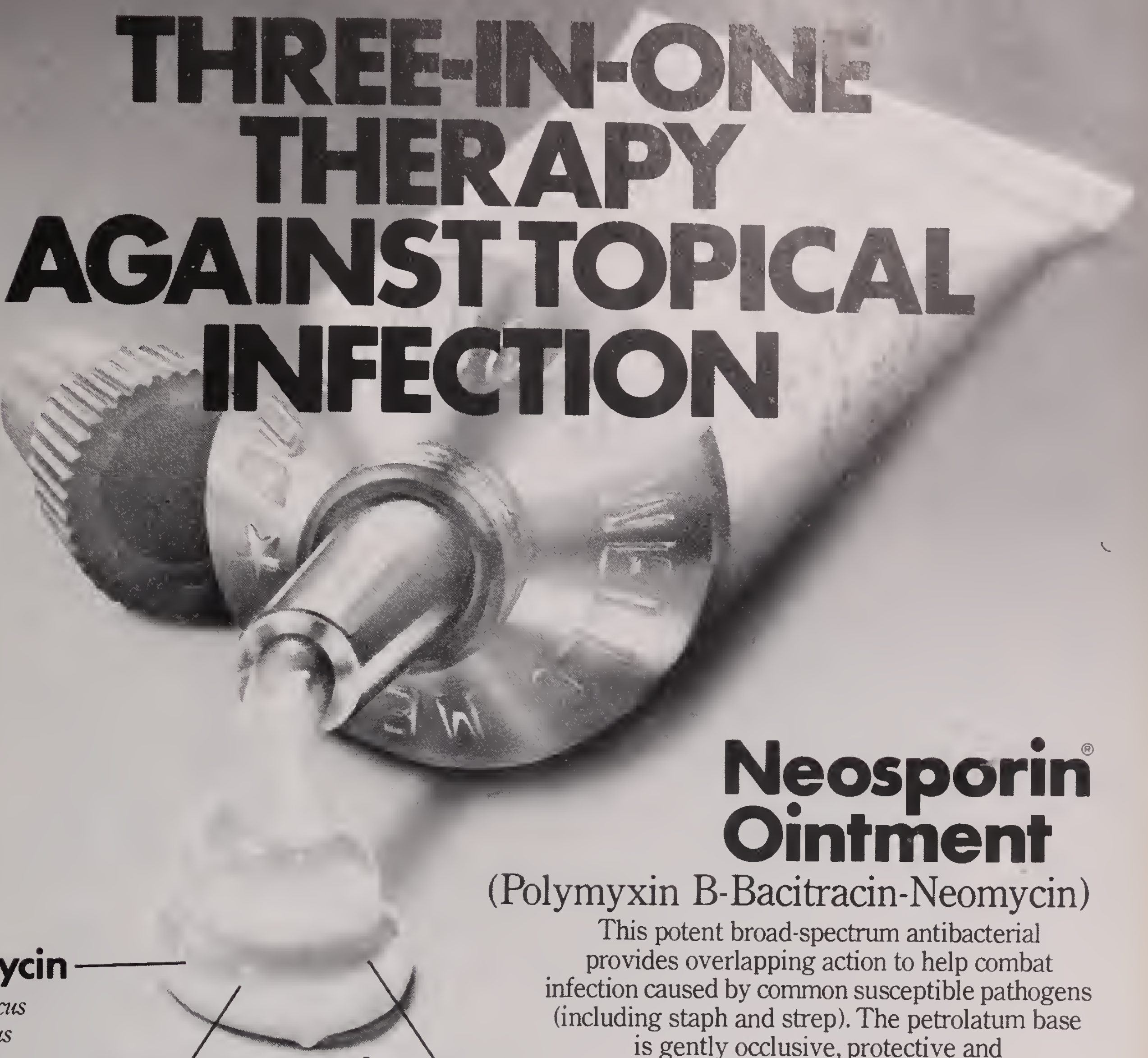

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PRECAUTIONS: As with other antibacterial preparations, prolonged use may result in overgrowth of nonsusceptible organisms, including fungi. Appropriate measures should be taken if this occurs.

ADVERSE REACTIONS: Neomycin is a not uncommon cutaneous sensitizer. Articles in the current literature indicate an increase in the prevalence of persons allergic to neomycin. Ototoxicity and nephrotoxicity have been reported (see Warning section).

Complete literature available on request from Professional Services Dept. PML.

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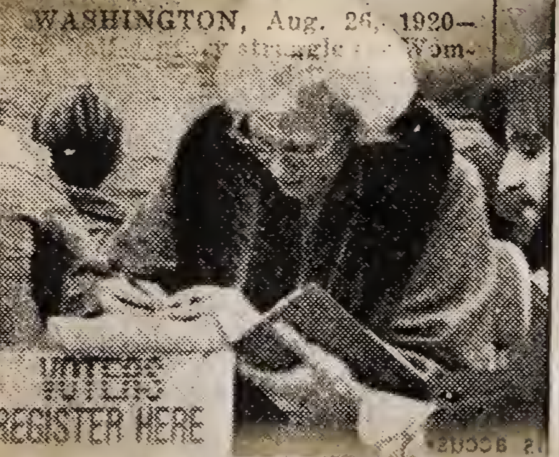

Social Security Bill Is Signed Gives Pensions to Aged, Jol

Roosevelt Approves Message Intended to Benefit 30,(Persons When States Adopt Cooperating Laws-He the Measure 'Cornerstone' of His Economic Progr

WASHINGTON, Aug. 1 The Social Security Bill, r a broad program of unem insurance and old age and counted upon to ben 20,000,000 persons, becam day when it was signed l dent Roosevelt in the pr those chiefly responsible ting it through Congress.

Mr. Roosevelt cal "the cornerstone whic is being me s comple ri to

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WASHINGTON, March 10, 1971—The Senate approved today, 94 to 0, and sent to

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Meeting Gives Standing Ovation as Executive Pictures Peace Gain

"If we fail to use it," he declared to the solemn final meeting of the delegates, 'we shall betray all of those who have died in order that we might meet here in freedom and safety to create it.'

"If we seek to use it selfishly—for the advantage of any one nation or any small group of nations—we shall be equally guilty of that betrayal."

Fervent Interpolation

The President, speaking in the auditorium of the War Memorial Opera House, built in memory of sons of the Golden Gate city who gave their lives in the first World War, in which he himself served, seemed to give unconscious expression to the solemn feeling of the occasion when, at the outset of his speech, he interpolated the words, half a hope, half a prayer:

"Oh, what a great day this can be in history!"

Just before the plenary session

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WASHINGTON, Jan. 27, 1973—"With the signing of the peace agreement in Paris today, and after receiving a report from the

PATIENT PACKAGE INSERTS: A CONCEPT WHOSE TIME HAS COME?

The consumer's right to know is an irreversible and desirable trend of the Seventies. It extends, and properly, to a patient's right to know more about his or her prescription medications. One way, gaining favor, is through patient package inserts. Wisely-prepared and properly distributed when medically indicated, they could markedly improve patient knowledge and drug therapy—laudable goals by anyone's standards.

The PMA endorses these goals and will work with government, the health professions and consumers to achieve them.

The Advantages

The concept holds promise of benefits: better patient understanding of the product prescribed, better adherence to the treatment plan, and more awareness of possible side reactions.

Every doctor has had patients who fail to finish antibiotic regimens because they feel better. Some patients assume that if one tranquilizer or analgesic is good, two may be twice as good. Still others fail to report dizziness while on antihypertensive therapy —and so on.

Problems like these might arise less often if the patient received written information in addition to verbal instructions. Some studies suggest that patients are more receptive to such materials, and they more often understand the verbal instructions and follow them, when inserts are used.

The Disadvantages

There are also some potential problems. Obviously, the inserts must be clearly phrased, without extraneous or complex detail. How much information is enough? How can it be kept current? Should all patients receive the same information? Should inserts be included with all drugs? Should only potential problems be listed or are patients better off with a "fair balance" presentation that describes usefulness as well as drawbacks?

These and similar questions require answers, since model inserts have yet to be properly developed and tested. Despite the need for these studies, the FDA is proceeding prematurely with inserts on selected products. We think the Congress is the only place where the matter can be given the proper legal status and direction, particularly since it represents a conceptual change in the legal, medical and social framework of the nation's prescription drug information system.

The Solution

The PMA believes that carefully-devised pilot studies of various kinds of inserts are needed. They should be developed and implemented with full participation by doctors, pharmacists, consumers, communications experts and the drug industry. Such studies will provide reliable pathways to follow, so that inserts will be useful aids to medical practice.

And particularly we think that you should be closely involved in this debate and in these studies and decisions. Otherwise, people with less experience and qualifications may control the purposes, content and use of a tool with considerable promise for improved patient care. It could make a difference in your practice tomorrow, and more importantly, in the health of your patients.

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Book Review

THE AMERICAN HEALTH CARE SYSTEM: ITS GENESIS AND TRAJECTORY, John Gordon Freymann, M.D., Medcom Press, 2 Hammerskjold Plaza, New York, New York 10017, 1974, 407 pages.

The forward by John S. Millis, Ph.D., states; "This work should be thoughtfully read by health professionals, government officers, legislators, educators and laymen from all walks of life."

With remarkable clarity and documentation the author presents a panoramic view of the American health care system. The text is divided into two parts: Genesis: From the middle ages to 1965; and Trajectory: From 1965 into the 21st century.

The evolution of Medicine from medieval England to 19th century America demonstrates the remarkable extent to which we have followed the English prototypes. The glorious era of crisis medicine with renowned accomplishment in prevention and cure of infectious disease, is described as is the development of subspecialization. American Medicine is now caught at the point of impact between that revolution initiated by the "Era of Pasteur" and the current revolution of the "Era of Darwin and Freud" where the principal health problems are congenital and prenatal defects, degenerative diseases, mental illness and conditions produced by our environment. The section "trajectory" presents personal (and obviously controversial) views of how the American health care system will change in the future. The impact on medical and allied health practice, medical and allied health education and current health care institutions is covered in considerable detail. The book is thought provoking and stimulating from start to finish.

Winston R. Miller, M.D.*
Minneapolis, Minnesota

THE INTERDISCIPLINARY ROLES OF THE NURSING HOME MEDICAL DIRECTOR, Michael B. Miller, M.D., Contemporary Publishing Company, Wakefield, Massachusetts, 1976.

This volume is devoted to detailed descriptions of multiple studies and case histories of one model of medical direction in an extended care facility. In addition seven medical and allied health professionals have authored a number of subsections. The dominant philosophy of milieu therapy with a closely integrated health care team toward the irrevocable goal of prolonging life as long as humanly possible pervades all reported studies and case reports.

As the first book devoted entirely to the role of the Medical Director of a long-term care facility, it is appropriate reading for all physicians who have now assumed such a position. Although everyone will not agree with the solutions, any physician interested in the care of the elderly will profit by the analysis and discussion of the multiple problems involved in long-term care.

Winston R. Miller, M.D.*
Minneapolis, Minnesota

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*Posthumous

Letters to the Editor

Dangers of the Last Chance Diet

Dear Editor:

Quite a number of persons in Minnesota are apparently undertaking the Last Chance Diet, made popular by a book of the same title (Dr. Robert Linn, Bantam Publishers, New York), without medical supervision. This may be dangerous.

The Last Chance Diet is very similar to the scientifically studied[1,2] protein sparing modified fast (PSMF), which is only a slight modification of total starvation. The difference is that the patient on the Last Chance Diet takes a small amount of liquid protein hydrolysate (300-500 kcal) which allows the body to conserve protein mass. The PSMF has not been tested in any large scale, long term, clinical trials and so the actual short and long term adverse effects have not been established. However, a considerable amount is known about starvation.[3–6]

Within 24 hours of starting to starve, the body ordinarily has used up all of it's glycogen stores. This is associated with a significant natriuresis and kaliuresis, and a subsequent water loss. Dehydration will ensue unless corrected by administration of fluids. Clinical hypokalemia may also occur if not corrected. Administration of sodium may be associated with excessive water retention and therefore should be undertaken cautiously if at all. When there is no glycogen present, the body turns to metabolizing amino acids to provide glucose for the brain. The body cannot usually provide enough glucose to satisfy the brain's metabolic needs and therefore, the brain commonly switches to metabolizing ketones. This is an abnormal condition for the brain metabolically and may explain psychopathological changes that occur in starving patients.

When there is no carbohydrate present and the body is metabolizing fats, it is inevitable that ketoacidosis will ensue. In starvation, the acidosis, is compensated for by a decrease in the formation of urea and an increase in the excretion of ammonia. This gives a characteristic odor to the urine. Ketone bodies compete with uric acid for renal secretion and a clinical hyperuricemia, complicated by a low serum pH can lead to clinical gout, even in patients with no previous history of this disease.

Refeeding after starvation is difficult (one might say ticklish). During the starvation period, the gastrointestinal tract slows down both in motility and in cell regeneration. Potassium tablets of any type are contraindicated in such patients because of their slowly moving gastrointestinal tracts. The pancreas also slows or stops production of digestive enzymes. Diarrhea is common during the refeeding period and may complicate matters by increasing the dehydration already present. Carbohydrates stimulate insulin secretion which shuts off lipolysis and may result in rebound hypoglycemia. Alcohol, aside from containing 7 unneeded calories per gram, inhibits ADH secretion and may further aggravate dehydration. It is not known what effects stress from surgery, trauma or other sources will have upon patients who are taking this diet, but they are probably not favorable.

To realize the maximum benefits of this diet, it is essential that some sort of behavioral modification technique be employed. Soon after stopping the diet, unless the patient changes his/her attitudes and behavior towards eating and exercising, they will be right back where they started.

Gout patients, cardiac patients, pregnant women, and patients with renal or hepatic

March 31-April 4, 1978. 41st Annual New Orleans Graduate Medical Assembly.

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dysfunction should be advised not to undertake this diet at all.

In conclusion, the Last Chance Diet or Protein Sparing Modified Fast, is a relatively untried regimen. The discoverers themselves have recently voiced serious concerns over the lack of sufficient long term studies to determine its safety and efficiency. The reader is urged to read one or more of the references listed below.

Joseph A. Cornell, Pharm.D.
Drug Information Center
University of Minnesota

One death due to the Last Chance Diet was mentioned on "The World News" Huntley & Brinkley (CBS 10/17/77, 5:30 PM)

Editor's note: A total of 26 deaths due to the Last Chance Diet have occurred, three of which were in Minnesota. The Federal Drug Administration is talking about banning the diet.

References

1. Apfelbaum: The Effects of Very Restrictive High Protein Diets. *Clinics Endo and Metab* 5(2):417 (Jul) 1976.
2. Bristrian, BR, Blackburn, GL, Flatt, JP et al.: Nitrogen Metabolism and Insulin Requirements in Obese Diabetic Adults on a Protein Sparing Modified Fast. *DIABETES* 25 (6): 494 (June 1976.
3. Cahill, GF JR.: Starvation in Man. Clinics Edno and Metab. 5 (2) 5 (2): 397, (Jul) 1976.
4. Keys, A:, Brozek, J, etal.: The Biology of Human Starvation. Minneapolis; University of Minnesota Press 1950.
5. Levenson,, SM, Crowley, LV, Seifter, E: Starvation. Chapter 11, in Manual of Surgical Nutrition, Ballinger, W.F. editor. W B. Saunders and Co., Philadelphia, 1975.
6. Cahill, GF Jr: Starvation in Man. New Eng J Med 282: 668, 1970.

COVER PHOTOGRAPH

"Making Tracks"

Dr. Bruce Nydahl, internist practicing in Minneapolis, took the cover photo while cross-country skiing in Braemar Park. He was taking pictures of interesting subjects and came upon these tracks.

Dr. Nydahl is a University of Minnesota Medical School graduate and presently is a Clinical Assistant in the Department of Medicine at the University. He is married and has three children.

On the December, 1974, cover of MINNESOTA MEDICINE Dr. Nydahl's photo of "Minnehaha Falls" was featured, and this cover was the runner-up for the Cover Award given each year by MINNESOTA MEDICINE.

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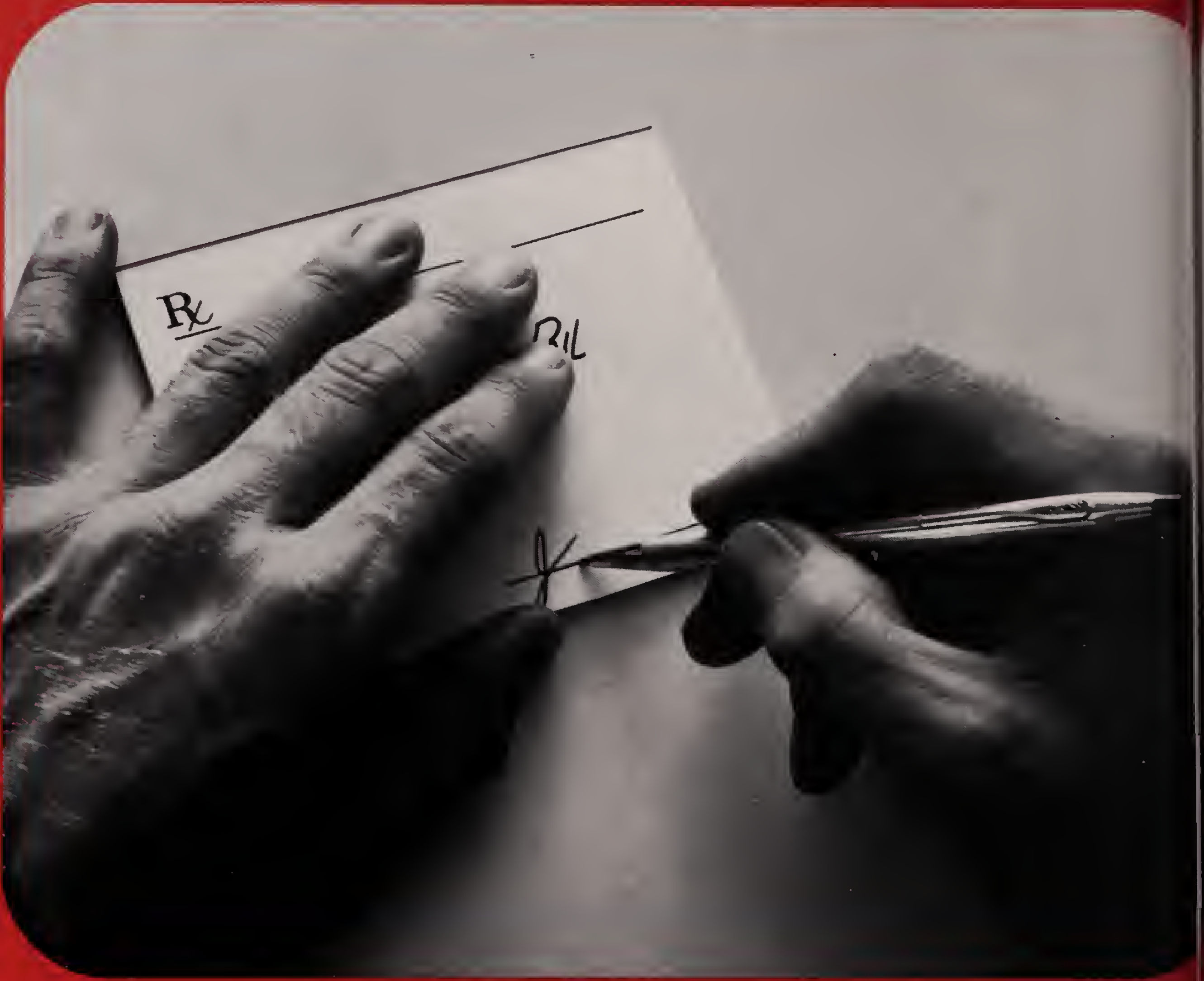

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cause, are dryness of mouth, thirst, weakness, lethargy, drowsiness,
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oliguria, tachycardia, and gastrointestinal disturbances such as nau
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propriate replacement is the therapy of choice.
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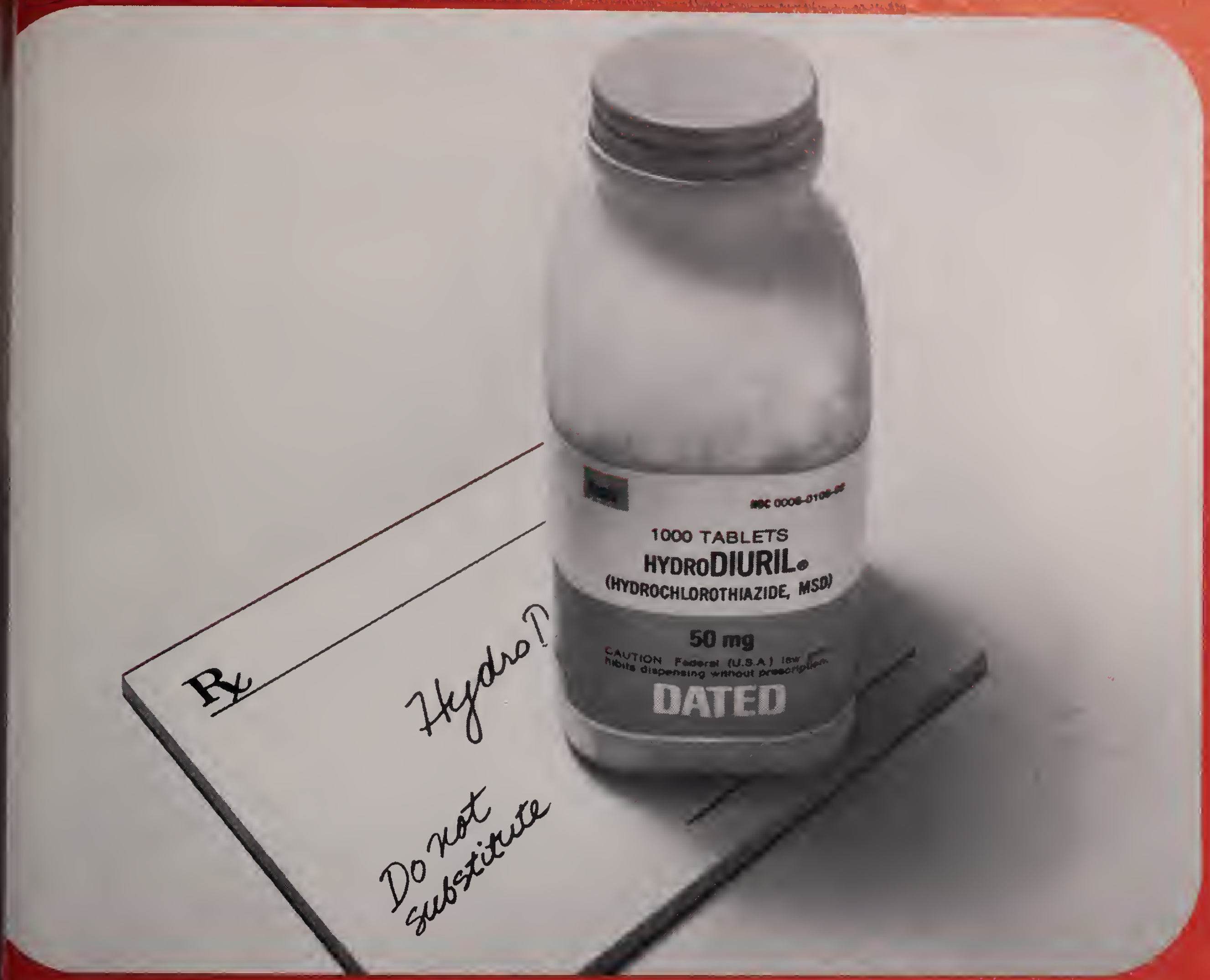
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Special Article

The Epidemiology of Skiing Injuries

MICHAEL H. CRIQUI, M.D., M.P.H.*

Most studies of skiing injuries have been flawed by problems of methodology and/or data analysis. Sex *per se* has not been demonstrated to be a consistent predictor of injury. How ski lessons affect injury rate is unclear. The evidence suggests the following skier categories are independently at increased risk of injury: the less experienced skier, the low ability skier, the fatigued skier, and the skier wearing non-release or cable bindings. Bindings with more than the standard two release modes may decrease the injury rate for certain skiers.

SKIING INJURIES are a significant cause of morbidity in the United States. Various estimates of the injury rate range from 4 to 10 per 1000 skiers per day.[1,2,3] At least 300,000 skiing injuries occur annually.[3] 30 to 35% of reported injuries involve fractures and an additional 3-4% involve dislocations.[4] The majority of the remaining injuries involve sprains, many of which are severe and disabling.[4] Several factors, including age, sex, ability level, experience, ski lessons, safety bindings, and fatigue have been postulated to affect the risk of injury.

Skiers are not a representative sample of the U.S. population. The average skier is younger (early 20's), more likely to be male (55 to 73%), and more likely to be a student, college graduate, or professional.[3,5]

A number of articles relevant to the epidemiology of skiing injuries have appeared in the literature. To simplify analysis, only traumatic accidents during downhill skiing are considered here. Articles addressing risk factors and prevention of injuries will be grouped into two categories: epidemiologic implications in non-epidemiologic studies and epidemiologic studies.

Epidemiologic Implications in Non-Epidemiologic Studies

Many non-epidemiologic studies of skiing injury have nonetheless addressed questions of risk factors and etiology. The following representative articles are discussed in approximate chronological order.

In 1958 Howkins[6] noted that an insurance company, analyzing claims for skiing accidents, found that skiers not wearing release bindings sustained more expensive and thus presumably more severe injuries than skiers who did wear release bindings. However, the more experienced skiers were those more likely to wear release bindings, and severity of injury may have been a function of skiing experience rather than binding type. Such implied relationships (non release binding — increased severity of injury) when a covariable may be equally responsible (less experienced skier — increased severity of injury) recur throughout the ski injury literature. Alternative hypotheses taking into account possible covariables need to be explored.

A related consideration is illustrated by Moritz's[7] 1959 paper. He correlated injuries with time of day, hours of skiing before injury, and years of skiing experience. He noted injuries were more common in late afternoon, after about three hours of skiing, and in a skier with four years or less skiing experience. However, since an uninjured control group was not studied, inferences from these data about fatigue or inexperience as risk factors are unwarranted. Denominators or control populations have often been inadequate or absent in ski injury studies. Moritz also noted a predominance of release bindings in the Sun Valley, Idaho skiing population, but a predominance of non-release bindings in the injured subgroup. Kraus[8] presented similar findings. Yet Moritz noted that experienced skiers had a lower injury rate. If experienced skiers are more likely to wear release bindings, here, as in the Howkins study, experience rather than release bindings could be the relevant safety factor.

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*Department of Community Medicine, School of Medicine, University of California, San Diego.

In 1962 Earle et al.[1] published an analysis of 1470 injuries from Sun Valley, Idaho. They tabled the distribution and etiology of ski injuries, but recognized that the absence of controls limited their ability to generalize. They documented a finding which was later to assume importance in defining the ski injury problem — one-third of skiers with lower extremity *fractures* did not require ski patrol assistance.

In 1963 McIntyre[9] published a report on ski injuries from Quebec. He stated that most accidents involved beginners and the more daring, and that women were at slightly increased risk. No controls were utilized. Howorth[10] in 1965 noted that training, experience, conditioning, good equipment, courtesy, and a proper regard for other's rights and safety would reduce skiing injuries, and felt nearly all ski injuries were preventable. These statements, however reasonable, were based on opinion rather than data. Howorth also noted the low incidence of injuries to skiers while taking lessons. The implication was that lessons decrease the injury rate, but no data were cited for instructed skiers outside the lesson period.

Harwood et al.[11] discussed ski injuries in the Syracuse, New York area in a 1966 paper. They noted almost half the release bindings checked in a group of injured skiers who stated their bindings didn't release were adjusted improperly. Bindings were not checked, however, either in injured skiers whose bindings did release or in uninjured skiers. Tucker et al.[12] in 1967 also discussed bindings. They noted that no binding then in existence could be adjusted to release in all conceivable situations of dangerous stress to the leg. A recent report on bindings indicates that all presently available bindings freeze up and become non-functional in the laboratory if exposed to water followed by a freezing temperature.[13] A similar situation hypothetically might occur on the ski slope.

Hutchings,[14] in a 1969 article from Australia, said . . . "the major causes of ski fractures are failure of safety bindings to release brought about by faulty adjustment, and snow conditions, the most dangerous being the alternate freeze and thaw of spring snow." No data are presented. On the other hand, Ellison,[15] a ski injury authority, wrote in a 1973 editorial that physical conditioning, fatigue, and improper adjustment of bindings had been studied and were *not* significantly related to injury rate. Unfortunately, he did not cite specific studies.

Epidemiologic Studies

In this section, six studies of skiing injuries that were more or less epidemiological by design and intention will be considered in chronological order.

In 1962 Haddon et al.[2] published a study of skiing injuries. Haddon, a nationally recognized figure in accident research, stated "the fundamental question in searches for the etiology of accidents, as well as other causes of morbidity, is how do persons affected differ from those who are not." He noted the failure to investigate this question in any type of recreational accident, and proceeded to study the Mt. Snow, Vermont ski population on four consecutive weekends beginning January 28, 1961 through February 19, 1961. Cases were those who came to the resort's medical facility on the day of the injury. Controls were obtained by interviewing in considerable detail every fiftieth person obtaining a lift ticket on those weekends. Interview refusal was miniscule (1.1%). A significant association was found ($p < .01$) between lower extremity injuries and non-release bindings in males matched for age and ability. No such association existed in females. Females were noted to have a higher injury rate than males (7.9/1000/day vs. 4.9/1000/day). Skiers in the lowest ability category generally had a higher injury rate. Multiple other variables including weight, experience, rental skis, and marital status were not significantly related to injury rate. The implications that being female *per se* conferred a greater risk of injury is questionable, because the lowest ability group had the highest injury rate, and females were over-represented in this group (61% of females were in the lowest ability group, compared with 51% of males). In addition, if sex and/or ability level somehow influenced the likelihood of an injury being reported, this could confound the calculated injury rate.

McAlister et al.[16] studied skiing injuries at three resorts near Anchorage, Alaska. Cases consisted of injuries reported to the ski patrol and sustained on weekends between January and May, 1963. Unreported injuries were assumed to be few due to the distance to other medical attention. The control group consisted of all skiers buying lift tickets on six weekend days during the season. An attempt was made to measure the vertical feet skied per day per person by using questionnaires. The authors concluded that injuries decreased with age, were fewer for ability levels beyond beginner, and were independent of sex.

It was noted that the injured intermediate and advanced skiers skied nearly as many vertical feet as their controls despite the fact their accidents curtailed skiing for the day. Furthermore, the injured group was skiing more vertical feet per hour in the late afternoon, the time that the highest percentage of accidents occurred. By comparing the number of people skiing at a given time of day with the number of injuries at these times, the authors provided a denominator control group for the oft noted observation that injuries are more frequent in the afternoon. This comparison indicates a lower than expected number of injuries before 2 p.m. and an excess thereafter. This data thus lends some credibility to the hypothesis of fatigue as a risk factor. The study has two possibly significant problems: the high non-response-rate (46% of cases, 32% of controls) and the possibility that injured skiers who reported their injuries were a biased subset of the total.

Spademan[17] reported on 617 skiers treated in the Squaw Valley, California medical facility from December 1964 through March 1965. He felt loss of control and safety binding failure were the major causes of skiing injuries. However, as he noted, good controls were difficult to obtain, and his observations, while interesting, must be considered somewhat speculative.

In 1971 Garrick[18] reported studies of the much discussed relationship between formal ski instruction and a reduction in injury rate. He noted that those who had taken lessons appeared to progress more rapidly in ability, and wondered if the apparent protective effect of ski lessons was not spurious, since both lessons and low injury rate could be related to increased ability. However, the point seemed moot since the studies he reported showed no significant difference in injury rate between skiers who had or had not taken lessons.

Later the same year, Garrick and Kurland[19] reported a study on the significance of unreported ski injuries from Vail, Colorado. They divided injured skiers into those reporting injuries to the ski patrol and those treated at the medical facility who did not report to the ski patrol. Comparing these groups revealed that young, female, and inexperienced skiers were each more likely to report an injury. Additional variables when corrected for age, sex, and ability were not significantly related to reportability. In addition, they found 15% of the skiers with fractures did not report to the ski patrol, and unless the skier was completely unable to ambulate, reportability was almost unrelated to the severity of injury. The problem of reportability might have been further clarified if each high reporting characteristic (e.g., inexperienced) had been analyzed independent of the effect of the other two (e.g., inexperienced skiers may be more likely to be young or female, and the association between being inexperienced and high reportability may be an artifact due to an increased likelihood of these skiers being young or female). Nonetheless, this paper provides strong evidence for a confounding influence in many ski injury studies, in that the types of skiers usually noted to have the highest injury rate are those who tend to report injuries more frequently.

Shealy et al.[3] in 1972 studied a ski club from Buffalo, New York. Baseline information was obtained from 72% of 2895 members before the ski season. Mid and post-season questionnaires uncovered 221 injuries in the study population of 2071. The authors included in their analysis the effect of method of skill acquisition and type of release binding. They came to three major conclusions: *First,* lessons were associated with high accident rates. The accident rate per 1000 skiers per day for the self-taught group was 7.1; for the mixed group (some lessons, some self-teaching) 8.9, and for the group who learned predominately by lessons 9.8 ($p < .01$). In addition, skiers were classified as fast, normal, or slow learners by calculating ability/experience ratios. Both fast and slow learners had higher accident rates than normal learners ($p < .001$). The authors suggest that lessons might imbue a skier with a false sense of security by increasing his ability/experience ratio. An alternative possibility mentioned by the authors, is that lesson takers are self-selected for fear, awkwardness, or lack of coordination and thus *a priori* have a higher accident rate. *Second,* bindings with more than the conventional two release modes (laterally at the toe, upward at the heel) had lower accident rates than those with only two modes. However, the authors noted that advanced and female skiers considered separately did not appear to benefit from more than two release mode bindings. Advanced skiers had a decreased lower extremity injury rate with more than two mode bindings, but an increased upper extremity injury rate, conceivably as a function of more premature release in this group of harder skiers. The authors speculated that female skiers' musculoskeletal structure may have been less compatible than that of males with the fixed ratios of force required to release these bindings in other than the two conventional modes. Thus in analyzing accident rate, interaction seemed to exist both between the variables of ability level and type of binding and sex and type of binding. *Third,* cable bindings were categorically dangerous. This was true for both sexes and all ability levels.

Unfortunately, even this excellent study leaves some issues unclarified. The lack of additional protection for advanced skiers and female skiers by bindings with more than two release modes would have been further clarified if accident rates had been examined separately in advanced skiers divided into males and females and female skiers subgrouped by ability level.

In addition, were skiers who completed the population questionnaire somehow different from those who didn't? Did all injured skiers complete the accident report form, and if not, were non-completors somehow different? Are skiers who select release bindings with more than two modes more safety oriented at any ability level?

Discussion

Studies of skiing injuries have suffered problems of methodology and data interpretation. Methodologically, the major problems have been the lack of population denominators or control groups, especially in the earlier studies, and the lack of appreciation, until recently, of significant injury reporting differences among different classes of skiers. In terms of data interpretation, a major problem has been inadequate isolation of the risk factor under study; that is, evaluation of one risk factor holding constant other variables which are associated both with that risk factor and with the injury rate.

In addition, the ski injury problem has been dynamically changing in recent years due to rapid evolution in equipment technology. Skis are shorter and quicker, boots higher, stiffer, and more responsive, and bindings more sophisticated and reliable. Shorter skis provide better maneuverability, increased ease of turning, and transfer lesser forces to the leg because of the shortened lever arm. The new boots allow for improved edge control and quicker turns. Technological advances in bindings and the virtual disappearance of non-release bindings should theoretically afford the average skier more safety. However, Coren[20] has suggested the percentage of upper ability skiers has increased considerably since 1960 and that a "skier day" now contains more and faster "skier miles", a trend conceivably perpetuating an injury rate that would otherwise be decreasing. New skiing equipment and styles might be allowing generally more aggressive skiing and higher speeds, conceivably placing both the individual skier and those near him on the slope at higher risk.

The summary effect of all these trends seems problematical. Indeed, some evidence indicates the actual injury rate has not changed very much, though the site of injury has.[4,21]

References

1. Earle AS. Moritz Jr. Saviers GB. Ball JD: Ski injuries. JAMA 180: 285, 1962.
2. Haddon W Jr. Ellison AE. Carroll RE: Skiing injuries. Epidemiologic study. Public Health Rep 77: 975-985, 1962.
3. Shealy JE. Geyer LH. Hayden R: Epidemiology of ski injuries: Effect of method of skill acquisition and release binding accident rates. Hum Factors 16: 459, 1974.
4. Gutman J. Weisbuch J. Wolf M: Ski injuries in 1972-73. A repeat analysis of a major health problem. JAMA 230: 1423, 1974.
5. Merendino JR. Lehmann O: Background of ski injuries. J Med Soc NJ 66: 3, 1969.
6. Howkins J: Skiing accidents. Br Med J: 1006, 1958.
7. Moritz JR: Ski injuries. Amer J Surg 98: 493, 1959.
8. Kraus H. Prevention and treatment of ski injuries. JAMA 169: 1414, 1959.
9. McIntyre JM: Skiing injuries. Canad Med Ass J 88: 602, 1963.
10. Howorth B: Skiing injuries. Clin Orthop 43: 171, 1965.
11. Harwood MR. Strange GL: Orthopedic aspects and safety factors in snow skiing. NY J Med 66: 2899, 1966.
12. Tucker R. Lipe GC: Safety in a release binding. Industr Med Surg 36: 30, 1967.
13. Greenburg A: Zen, ice, and the art of ski binding maintenance. Skiing 28 (6): 4, 1976.
14. Hutchings J: A five year survey of skiing fractures from Falls Creek, Victoria. Med J Aust 2: 174, 1969.
15. Ellison AE: Skiing injuries. JAMA 223: 917, 1973.
16. McAlister R. Brody JA. Hammes LM. Feltz ET. Duncan DL. Williams ML: Epidemiology of ski injuries in the Anchorage area. Arch Envior Health 10: 910, 1965.
17. Spademan R: Lower extremity as related to the use of ski safety bindings. JAMA 203: 445, 1968.
18. Garrick JG: The epidemiology of ski injuries. Minnesota Med 54: 17, 1971.
19. Garrick JG. Kurland LT: The epidemiological significance of unreported ski injuries. J Safety Research 3: 182, 1971.
20. Coren HZ: Ski injuries JAMA 232: 348, 1975.
21. Erskine LA: Recent changes in the pattern of skiing injuries. J Trauma 14: 92, 1974.

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Gerontology

The Medical Director of a Nursing Home
Legal Basis and Professional Challenges*

WINSTON R. MILLER, M.D.†

DURING MOST OF the 250 years since the founding of the Pennsylvania Hospital, the first voluntary hospital in this country, the American health care system closely followed precedents in Great Britain.[1] Two significant developments have influenced American medicine since the turn of the century. The Flexner report on medical education issued in 1912 initiated a sixty year period of marked increase in the number of medical schools of academic specialization and subspecialization with emphasis on crisis oriented medicine and the encouragement of huge public expenditures on medical research. The British nationalization of their health care system emphasized equal access to primary care by general physicians and full-time specialist control of all hospital services. The specialty of Geriatrics began in Great Britain as a direct result of governmental construction of geriatric day care hospitals. Geriatrics has become a prominent specialty in Great Britain—a marked contrast with the United States where it has been given little recognition.[2]

Nursing homes developed as a purely American phenomenon after passage of the Social Security Act of 1935. In spite of rapid growth in size, numbers, and modernization of nursing homes, health care professionals have assumed a minor role to improve the quality of care of nursing home patients. With passage of Medicare and Medicaid amendments to the Social Security Act in 1965 and the socio-political pronouncement of optimum health care as a basic human right, increasing emphasis has been placed on the quantity and quality of professional services for the publicly supported residents of nursing homes and other long-term care facilities.[3] Most of the emphasis has been initiated by constantly increasing federal regulations. However, the 1974 federal regulation for an employed Medical Director in all skilled nursing homes was unique, since it was patterned directly from detailed recommendations by the American Medical Association in 1973. Geriatrics was accorded the status of a specialty in this country.

The purpose of this paper is to outline the legal requirements for the medical director of a skilled nursing home and to relate these requirements to the professional opportunities of this position in our rapidly changing health care system.

The legal requirements specified in federal regulations are summarized in the Table.

TABLE

Legal Requirements of Medical Director

I. Employment pursuant to a written agreement.
II. Designation by the medical staff (if any) with approval of the Governing Body.
III. Responsibilities for coordination of medical care.
    A. Development of written by-laws and rules delineating responsibilities of attending physicians.
    B. Liaison with attending physicians ensuring prompt written orders.
    C. Periodic evaluation of adequacy of staff and services.
IV. Responsibilities to the skilled nursing facility.
    A. Surveillance of employee health.
    B. Review of incident and accident reports.
        1. Identify hazards to health and safety.
        2. Give administrator information on ensuring a safe and sanitary environment.
    C. Responsible for execution of patient care policies.
        1. Policies developed by group of MD's, RN's and others.
        2. Review policies at least annually.
        3. Make policies available to physicians, agencies, patients and public.
        4. Provisions for meeting the total medical and psychosocial needs of patients: (a) admission, (b) transfer, (c) discharge planning, (d) range of available services, (e) frequency of physician visits, (f) protection of patients' personal and property rights.
        5. Patients medical records and committee meeting minutes reflect: (a) patient care in accordance with policies, (b) compliance with utilization review committee recommendations.
        6. Day-to-day execution of policies delegated in writing to MD or RN. If RN, MD provide medical guidance.

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*Adapted from the presentation at the Seminar for Medical Directors of Long-term Care Facilities; Department of Family Practice and Community Health, Office of Continuing Medical Education, University of Minnesota October 15-16, 1976.

†Clinical Assistant Professor, Internal Medicine, University of Minnesota School of Medicine; Director, Section on QA&R, Division of Health Facilities, Minnesota Department of Health, 717 Delaware St. S.E., Minneapolis, Minnesota. (Posthumous)

Federal regulations issued on October 3, 1974 require each skilled nursing facility to retain a medical director and to delineate his responsibilities and compensation in a written agreement. If an organized medical staff exists, the staff must designate the medical director with approval by the governing body.

Regulations prescribe two areas of general responsibility; coordination of (1) medical care; and (2) services to the facility. Coordination of medical care includes the development of written by-laws and rules for attending physicians and effective professional liaison with them. It also includes periodic evaluation of the whole staff and all patient services in the institution.

Responsibilities to the facility cover many facets of medical administration. The medical director will need to broaden his approach from the traditional one-to-one physician-patient relationship to supervision of total patient care. He will have an important leadership role in employee health, in assuring a safe and sanitary environment, and in development and implementation of detailed policies regarding multiple components of patient care.

In essence the medical director must become a specialist in the care of aged and disabled patients and oversee and coordinate all the services provided by the health care personnel.[4]

Although not yet generally realized, the roles of the medical directors of nursing homes will place many of these physicians in the forefront of significant changes in the health care system during the next twenty-five years. These will relate basically to the following four areas:

A Shift of Emphasis from Acute Disease to that of Chronic Disease

Dr. John Freymann describes the current situation in Medicine as being "caught in the point of impact between two revolutions": the scientific revolution which emphasized crisis care, curing the patient, and super-specialization; and the socio-political revolution when our main health problems became congenital and prenatal defects, degenerative diseases, mental illness and conditions produced by our environment.[1]

With an aging population, medical care needs are shifting rapidly to comprehensive geriatric care which will involve attention to preventive maintenance for the maximum capability for normal living in the presence of all processes and disorders of aging.[5,6] The historical gap between public health and curative medicine "should be closed, since medicine has cured most curable diseases and the residue of chronic conditions is best handled by preventing them or detecting them before they become medical crises".[7] Medical directors of nursing homes, who will be among first Geriatricians in this country will find themselves leaders in setting criteria and defining standards for those who should be admitted to long-term care facilities, what kinds of patients are most appropriately placed in the various kinds of facilities and what kind of care system is required.

Increasing Institutionalization and the Development of Team Performance

As the health care system becomes a public utility, it will be more institutionalized. Hospitals, nursing homes and medical clinic groups are forming new and unique service units and expanding their roles; health maintenance organizations are growing in size and numbers; and an increasing number of physicians are entering group practice or working for established institutions.

Employment of multiple health care disciplines in an institution requires competent administration for effective coordinated team effort. Physicians functioning in medical administrative roles have usually performed in a voluntary capacity and without administrative training or experience. Although many universities now offer short and long term training in health care administration, few physicians currently enroll in such courses.[7] However, when physicians are employed under contract for medical administration and paid reasonable stipends, they frequently strive to increase their expertise in administration.

The thousands of new medical directors in skilled nursing facilities will find new professional challenges in medical administrative duties.[4,8] This movement may be the beginning of a significant expansion in medical administration by physicians. The medical director of a skilled nursing facility must become thoroughly knowledgeable about all facets of administration and provide leadership, guidance and assistance in developing a system of high quality services to the patients. He will become a leader in administering team performance, referred to by Dr. Michael Miller as milieu therapy.[8]

Public Accountability with Quality Control and Cost-Effectiveness

Public accountability of overall quality control and cost-effectiveness poses difficult dilemmas for physicians and other health care professionals.[9] Although quality control of patient care was started by the

American College of Surgeons as early as 1919 and greatly expanded over the ensuing years by the Joint Commission on Hospital Accreditation, the state-of-the-art is still primitive.[9]

Federal regulations to improve quality control and cost-effectiveness have increased greatly since 1965. Utilization review, quality control and fiscal intermediaries, professional standards review organizations, certification surveys and independent professional review have overlapping functions and differing methodologies, are all aimed at innovative approaches to quality control and cost-effectiveness.

Quality assessments are divided into three approaches: structure, process and output or outcome.[10] Structure focuses on the prerequisites for patient care—physical facilities, existing staff and appropriate policies and procedures. Process focuses on assessing actual performance of the various policies, procedures and services. Output or outcome concentrates on the results of patient care—assessment of individual patient needs and how well they have been met.

In the relatively new nursing home industry, federal regulations have employed all three types of quality assessment. The lack of precedents similar to those in hospitals have tended to make federal regulations for nursing homes much more detailed and stringent. Extensive internal peer review is required by a utilization review committee in each skilled nursing facility.[11] Each state is required to carry out a system of periodic medical review as an external peer review mechanism to assure the quantity, quality and appropriate level of care for all Medicaid patients.[12,13] Internal and external peer review have been regarded as preferred mechanisms for the output or outcome approach to quality control. Since the patient population varies so widely in nursing homes of different types and geographic locations, public accountability for quality care of publicly supported patients requires a system of patient assessment which is flexible enough to cover a wide variety of local situations.[14] The Office of Nursing Home Affairs of the Department of Health, Education and Welfare is now engaged in Phase II of the "Long Term Care Facility Improvement Study" to develop and test a new instrument for assessing patient care needs and outcomes in all long-term care facilities.[15]

As a medical leader in long term care, the medical director of a skilled nursing facility must be concerned with the quality of patient care services provided by that facility. As a "grass roots expert" for long term care, he has a unique opportunity to provide realistic guidance for academic and political experts who will develop and set public policy for quality assurance in the future.[16] This challenge far exceeds the usual local contract responsibilities in any one skilled nursing facility. And yet, success in the local endeavor will relate to the problems of geriatric care in society as a whole.

Multiple Level Teaching in Health Care Delivery Settings

The definition of the word "doctor" as "teacher" is nowhere more appropriate than in the current era described by Freymann where the principle problems are degenerative diseases and disability and preservation of the maximum number of "health years".[1] Geriatric health may be regarded as the ability of the person to maintain his individuality and self esteem and to cope with his environment under the prevailing circumstances. As the patient's personal trustee, the attending physician has the mission of producing the maximum number of "health years" for his patient and providing needed professional services until the ultimate goal of death with dignity arrives.[1,17] The physician need not, and, indeed, cannot function alone in carrying out this responsibility—other health care professionals are needed and are available for assistance.[18] But the physician must be able to teach the other health care professionals how to help in this mission.[8]

The "Era of Darwin and Freud" is new, and health care professionals must be taught not only past accumulations of health care knowledge, but also the new challenges for professional performance in the next quarter to half century. Educational concepts have changed to life-time learning—undergraduate, graduate, in-service and continuing throughout life. And measurements of success in educational programs have currently emphasized demonstrated improvements in performance rather than simple increase in cognitive knowledge.

Medical directors of nursing homes will not only be administrative, professional and patient care leaders, they will also be teachers. Some will teach by example; some will teach in in-service programs; some will actively teach allied health professionals; and some will teach geriatrics and long term care to the next generation of physicians. These programs are not new but a void in medical leadership has been commonplace. The medical directors of skilled nursing facilities will find many professional challenges in teaching health care personnel improved performance of patient care services.[20,21]

These four areas are not entirely undeveloped.

Many new organizations and programs have already started which will provide support for professionally ambitious medical directors. There are a number of journals, associations, societies and teaching programs dedicated to gerontology, geriatrics, nursing home care and medical administration. The American Medical Association has now prepared a draft copy of a sixty page medical director's handbook.[19] A Minnesota chapter of the American Gerontology Society has been formed and the Minnesota State Medical Association is soliciting interest in formation of an organization of nursing home physicians. Geriatrics is now being taught at Universities with development of clinical rotation for medical residents in nursing homes.[20,21] A few medical directors of nursing homes in Minnesota are currently involved in teaching geriatrics and long term care.

Conclusions

Medical guidelines and federal regulations have set the stage for physicians as medical directors to provide leadership in development and expansion of the art and science of Geriatrics, in medical administration of long term care, in assessment of the quality and cost-effectiveness of care and in teaching in the health care delivery setting. The challenges, satisfactions, and rewards will be as great as in any other specialty in Medicine in the coming years.

References

1. Freymann, J G: The american health care system: its genesis and trajectory. Medcom Press, NY, NY, 1974. (See review in Book Review Section) page 810 this issue of Minn. Med.
2. Somers, Anne R: Geriatric care in the United Kingdom: an american perspective. Ann Intern Med 84:466, April 1976.
3. Medicare—Medicaid: An appraisal after ten years: Seven articles. Public Health Reports Vol. 91 #4 July-August 1976.
4. Schwab, Sister Marilyn: The role of the medical director in a long term care facility. Geriat Nursing 1:17-20 March/April 1975.
5. Glazier, William H: The task of medicine. Scientific American 228:13+ April 1973.
6. Neugarten, B: The future and the young-old. The Gerontologist 15:4-9 Part II, February 1975.
7. Freymann, J G: Medicine's great schism: prevention versus cure: an historical interpretation. Medical Care 13:525, July 1975.
8. Miller, Michael B: The interdisciplinary roles of the nursing home medical director. Contemporary Publishing, Inc; Wakefield, Mass. 1976. (See review in Book Review Section) page 810 this issue of Minn. Med.
9. McNerney, W J: The quandary of quality assessment. New Engl J Med 295:1505, December 1976.
10. Morrow, Gloria: Quality of care in nursing homes: an overview. The Journal, American Health Care Association September 1974.
11. Kane, R L, Olsen, D M, Thetford, C, and Byrnes, M S: The use of utilization review records as a source of data on nursing home care. Amer J Public Health 66:778, August 1976.
12. Miller, W R, Hurley, S J, and Wharton, E: External peer review of skilled nursing care in Minnesota. Amer J Public Health 66:278 March 1976.
13. Teeter, R B, Garetz, F K, Miller, W R, and Heiland, W F: Psychiatric disturbances of aged patients in skilled nursing homes. Amer J Psych 133:1430, December 1976.
14. Ryder, C F, Elkin, W F, and Doten, D: Patient assessment, an essential tool in placement and planning of care. Health Services and Mental Health Administration Reports 86:923, October 1971.
15. Long term care facility improvement study: introductory report. Office of Nursing Home Affairs; 5600 Fishers Lane, Rockville, Md. 20852.
16. Brook, R H, Williams, K N, and Avery, A D: Quality assurance today and tomorrow: forecast for the future. Ann Intern Med 85:809, December 1976.
17. Kubler-Ross, E, Wessler, S, and Avioli, L V: On death and dying. JAMA 221:174, July 10, 1972.
18. Pilsecker, C: Help for the dying. Social Work, pp 190-194, May 1975.
19. Medical director handbook, draft copy. American Medical Association, 535 No. Dearborn St., Chicago, Ill.
20. Miller, W R: Medical care for an aging population: implications for medical education. Minnesota Med 59:727, October 1976.
21. Libow, L S: A geriatric medical residency program: a four year experience. Ann Intern Med 85:641, November 1976.

Constant Intravenous Insulin Infusion during Labor and Delivery in Diabetes Mellitus — Caplan et al. — page 863.

6. Page, MM, Alberti, KGMM, Greenwood, R, et al.: Treatment of diabetic coma with continuous low-dose infusion of insulin. Br Med J 2:687, 1974.
7. Kidson, W, Casey, J, Kraegen, E, et al.: Treatment of severe diabetes mellitus by insulin infusion. Br Med J 2:691, 1974.
8. Semple, PF, White, C, Maderson, WG: Continuous intravenous infusion of small doses of insulin in treatment of diabetic ketacidosis. Br Med J 2:694, 1974.
9. Peterson, L, Caldwell, J, Hoffman, J: Insulin adsorption to polyvinylchloride surfaces with implications for constant-infusion therapy. Diabetes 25:72, 1976.
10. Sonsken, PH, Srivastava, MC, Tompkins, CV, et al.: Growth hormone and cortisol responses to insulin infusions in patients with diabetes mellitus. Lancet 2:155, 1972.
11. Olefsky, JM, Jen, P, Reaven, GM: Insulin binding to isolated human adipocytes. Diabetes 23:565, 1974.
12. Zierler, ZL and Rabinowitz, D: Effect of very small concentrations insulin on forearm metabolism. Persistence of its action on potassium and free fatty acids without its effect on glucose. J Clin Invest 43:950, 1964.
13. Pildes, RS: Infants of diabetic mothers. New Eng J Med 289:902, 1973.

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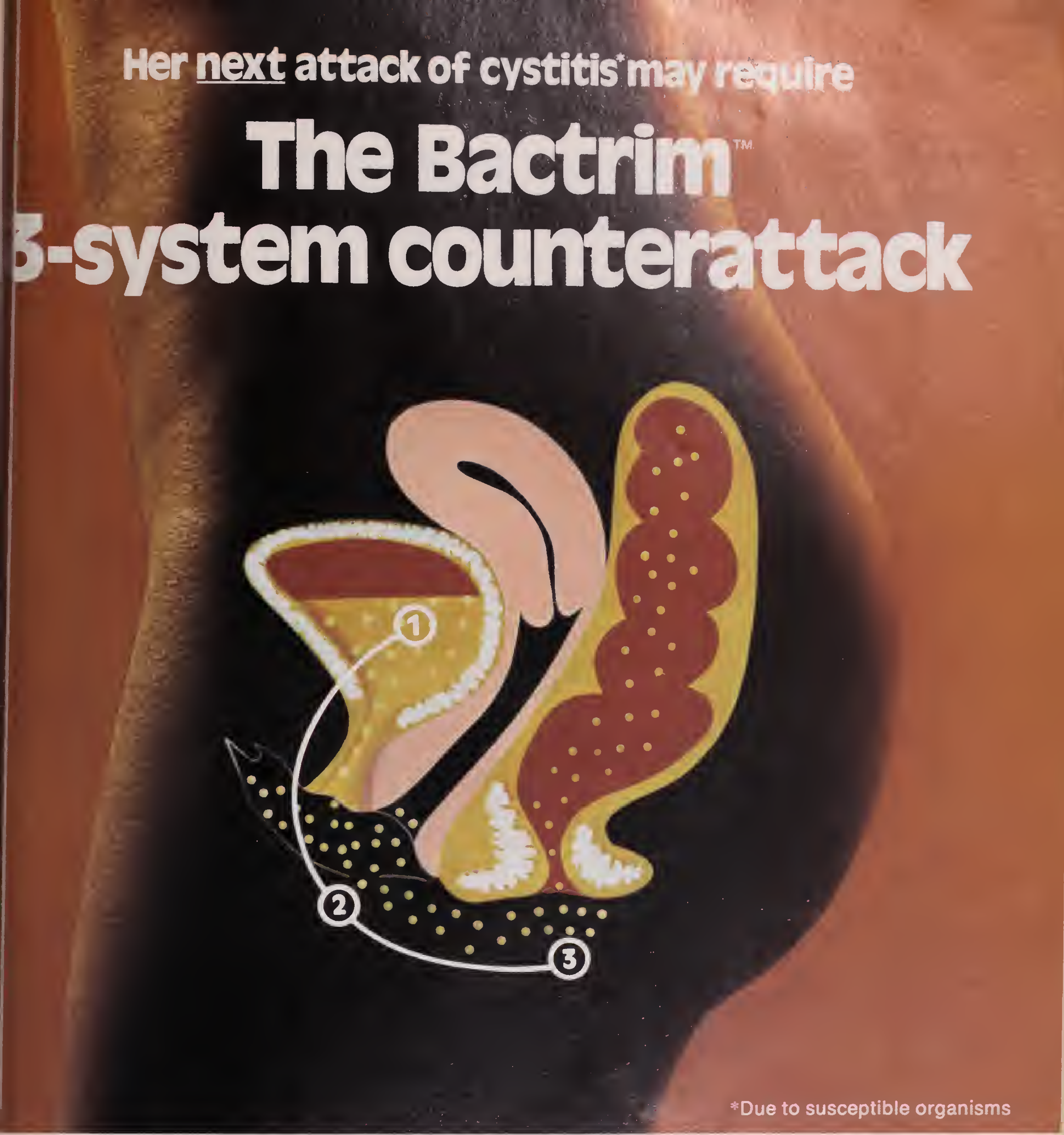
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Warnings: Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hematopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

Precautions: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function.

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Dosage: Not recommended for infants less than two months of age.

Urinary Tract Infections: Usual adult dosage—1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days.

Recommended dosage for children—8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, in two divided doses for 10 days. A guide follows:

Children two months of age or older

Weight		Dose—every 12 hours	
lbs	kgs	Teaspoonfuls	Tablets
20	9	1 teasp. (5 ml)	½ tablet
40	18	2 teasp. (10 ml)	1 tablet
60	27	3 teasp. (15 ml)	1½ tablets
80	36	4 teasp. (20 ml)	2 tablets or 1 DS tablet

For patients with renal impairment:

Creatinine Clearance (ml/min)	Recommended Dosage Regimen
Above 30	Usual standard regimen
15-30	½ the usual regimen
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Health Care Cost Commission

A Legislator's View of Health Expenditures*

SENATOR JOHN MILTON+

I REALLY SHOULD commend the Association for recognizing the seriousness of the problem that many of us have been concerned about for some time. To refresh your memory, it wasn't so long ago that the official position of organized medicine was that cost was a necessary by-product of quality care. Some of us disputed that at the time. I also am very heartened to read Dr. Frey's initial remarks where he broadens the responsibility of medicine beyond the 17% of expenditures in the American health system. Again, the traditional rhetoric from organized medicine has been that since doctors only accounted for 17% of direct expenditures in the American health system, that was all they were responsible for, but Dr. Frey in his opening remarks to the Commission presented a much more realistic picture of the way in which organized medicine does its job with such a profound impact on the decisions that are made within it, the health system.

I think you as members of this Commission, whether you be physicians or public members—must recognize that the by-products of this particular task that you are facing in the next 18 months may very well be recommendations for substantive change in the system. Any substantive change in the American health system that takes place is likely to effect physicians where it may hurt the most and that is the pocketbook. So that as your Commission reports back to the Association, as I assume it will in about 18 months, you are going to be faced with that kind of issue and as Dr. Frey said in his opening remarks, it is going to test you as to whether you are big enough and whether you are objective enough to come down on the side of the data and to present the findings.

I am going to give you some remarks that I think should only be described as a personal viewpoint of someone who has been in public office for about 8 years, spent most of his public career in the areas of health and welfare policy. I'd like to start off by describing some characteristics of the health system and then indicate areas where substantive change could have an impact on health expenditures. I will try to limit my suggestions to you to those things which can be done at the state or local level rather than rehash any discussion of what might happen in the Congress or in Federal government. Parenthetically, I would say that I think that for the first time we do have an opportunity at the state and sub-state level to effect health policy and make substantive changes in the way health care business is conducted in this country, and that we don't have to wait around to hear from the Congress and the Federal bureaucracy. I hope that will be the case and the signs are that the new Administration is willing to listen to what we have to offer out in the countryside. If that is the case, I think we have some pretty good ideas out here. It will be worth your while doing the work of this Commission.

Most of the suggestions I will make are not new. You will not, other than in the case of one or two of my pet ideas, probably hear anything that is radically new and you probably will not hear anything that you won't hear from other speakers during the 18 months that you are in session as a Commission. I would point out, however, that since many of these ideas are not new and have been around—have been proposed not only in Minnesota but in other legislatures and in the Congress—that most of them also have been opposed by organized medicine. Perhaps what is new today is that organized medicine is listening to the ideas and giving many of them a reconsideration. For that I am grateful and for that I thank you, Doctor Frey, for providing me the chance to come here today.

Obviously, to start off with, the American health system is essentially entrepreneurial. The fee for service system contrasted with the health systems in other countries is open-ended and many of the incentives that are built into this system, particularly from medicine, are entrepreneurial in nature. If you look at the places where we train physicians, where they learn how to behave the way they do, you must start with the very first day of medical school. With few exceptions in this country the medical schools, including that one that we are so proud of here in the state of Minnesota, have a particular culture and a particular style of training which emphasizes high technology, emphasizes specialty care and emphasizes the entrepreneurial spirit. It is little wonder that students coming out of those programs and going into residency or those coming out of residencies are inclined toward maximizing their income. I think that as we look at what can be done, we have to begin looking at values and role models within the system of education by which we train health providers. There also are some things that can be done with the training programs for other health providers—nurses, pharmacists, etc. The burden should not be entirely on medicine, but if you want to know why we are practicing the style of medicine we are in the state of Minnesota, you can begin with the first day of medical school.

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*A presentation to the Health Care Cost Commission at the Meeting in St. Paul, Friday, July 22, 1977.

+Executive Consultant, Control Data, Minneapolis.

The second characteristic I think of is that physicians are dominant. This is not so true in some other countries. In this country not only the way the system is organized, but the way it is perceived by the general public, is very medically oriented. When you ask people if they have adequate health care in their community, the standard response other than yes or no would be, "Yes, we have a good doctor. We have a fine doctor in our community, a family doctor." They relate immediately to that. You are not even asking about medical care—you are saying what is the health care in your area—but they make that transition. So obviously, physicians are dominant. We might look as a recommendation for change some way to give people access to the health system that doesn't require them to start with a physician. This is being done in some areas—it is known condescendingly by physicians as physician extenders, by others as practitioners and in China as barefoot doctors. Our access to the health system is almost entirely through medicine and curiously enough, when there is aberrant behavior in the system, as there is with the over utilization of programs such as Medicaid, we find that poor people, people on Medicaid, discover that access to a doctor may be difficult if you call a doctor's office for an appointment. You may have to wait for some time, but if you talk to the people down at Hennepin General or St. Paul Ramsey, they will tell you they found a way to access to the health system without waiting at all. And that is if you show up on a weekend morning at 6:00 a.m. or 6:20 a.m. you usually get to see a resident, who everyone thinks is a doctor anyway. Thus, even the ways in which people find to beat the system are medical. So I think I can stand on the statement that physicians are dominant. I don't carry a value judgment on that, although I think there may be a cost implication.

The other part of that is that medical emphasis results in an inappropriate use of facilities, and I think an over expenditure of capital. Within the system physicians dominate decisions about hospital facilities, equipment for hospitals, referral systems and the system of hospital privileges for group practices. For example, in the Twin Cities you can predict the behavior with regard to such things as CT scanners. You can predict that everybody is going to want one. The hospitals are under the gun so to speak to have all of the facilities and the equipment that they can provide to the physicians, who by the way are not at risk in terms of cost unless they own the hospital, and that is not true here in the state of Minnesota. When the physicians want more operating rooms—they get them. If they don't, the group takes its trade down the street. That is very easy to do here in the Twin Cities, though it doesn't happen very often because the implied threat is enough. If you have ever been on a hospital board and heard a surgeon saying how much they need more operating rooms, and in fact they may, you know it is a very difficult thing to resist. Particularly you are reminded that the hospital down the street has six new operating rooms and the latest CT scanners, etc. So that obviously has an effect on health. If we begin through the health planning process to put some limits on capital expenditures, and through the review process decide whether there really is a need for additional equipment or facilities, I think we could begin to get a handle on this problem. At least we will not be creating capital investment that will not have a rate of return. When capital equipment in the health system doesn't get used it gets paid for anyway. Unfortunately, it is not like gasoline stations. When I was with Mobil, if you made a bad decision on gasoline stations you really ate it. However, you could make them into Chicken Delights or something. In the health system, if you build too many beds you've got empty beds, and you simply raise the rate for everyone that fills a bed. And that pays for the empty bed. There hasn't been a way around that. There are some models now we are beginning to look at for solutions. Not just through certificate of need, because that is really a "what do we do now that the horse is out of the barn" kind of solution. We have too many beds in the metro area, for example. How do we get to where we actually reduce the number of beds? I don't suggest that this Commission can come up with a recommendation like this, but I understand that one of the major employers in Cleveland has decided that the best thing they can do for their community in terms of social responsibility is to buy a hospital and shut it down. It is not a bad idea and maybe we could provide some tax incentives for employers to do that, It is fairly threatening if you are working in one of those hospitals that perhaps should be shut down, but I lay that out for you as a suggestion.

The emphasis in the American health system is obviously on treating sickness. When we talk about the health system even by definition, we are talking about health costs. If everyone remained in their natural state, which is health, there would be no health costs, but clearly what we have is a sickness treatment system and financial rewards on it are skewed in that direction. In Minnesota when we looked at health expenditures three years ago we found that over 99% of all health expenditures were for curative, remedial, or medical kinds of intervention. These expenditures were mostly in inpatient care, high technology; the third party reimbursement system tended to put people into a higher and higher style and higher and higher technology of medicine. Less than 1% was spent in screening, health education and any kind of preventive techniques. If you were able to increase that 1% to 10% without jeopardizing the quality of care at the other end, I think you'd have more impact on the American health system than all the other kind of governmental regulatory devices that we in the political world cook up which mostly don't work.

Another characteristic is that treatments are often provided even to those who don't need them. Part of this is the by-product of the malpractice situation; there's a lot of pressure on physicians to do something at the conclusion of a patient encounter and to practice defensive medicine. One of the things that can be done about it would be to reduce tort liability. Your Association and I have agreed on that particular proposal and the lawyers in the Judiciary Committees beat us every time. It seems to me that there should be some limitations on liability. I think that unless there is, we are going to continue to have that kind of defensive medicine which, of course, results in unnecessary tests and unnecessary surgery. I know the physicians don't like to hear about unnecessary surgery, and that's why I would not dare come before this body without being able to cite some of the research and some of the facts that have been coming out in the last couple of years. One of them is on coronary by-passes done, by the National Heart, Lung and Blood Institute. This was a four year study in which the doctors at eight medical centers across the country tested patients, those who were receiving intensive drug therapy and those who were receiving a by-pass. The results were very interesting, mortality in the hospital after treatment was 4.1% for the medical treatment and 5% for the surgical patients. Followups averaging 24 months showed mortality was 5% for the medical group and 5.2% among the surgical patients. During hospitalization 18% of the by-pass patients had heart attacks compared with 10% in the medically treated group. A long-term followup indicated the rate was equal for both groups at 13%. One-third of the medical group eventually had by-pass surgery because of persistent pain, but one of the studies said that the data showed that delaying surgical treatment had no effect on mortality at all. Now that may not be the conclusive paper on that particular issue, but if you have heard Dr. Walter McClure talk about the American health system you'll know he reminds us that if everybody wanting a coronary by-pass in this country got one, it would add 20 billion dollars to the top of 140 billion dollars that we are already spending. Within the medical community the jury is still out as to the efficacy of that particular mode of practice.

I don't have to remind you all of the discussion about hysterectomies. In 1975 more uteri were removed than tonsils, about three-quarters of a million in one year. This is a 25% increase since 1970 and at that rate half of the American women over 65 will have their uterus taken out. The rate in this country is 2.5 times that in England and 4 times that in Sweden. It may be that the life style and environmental climate within this country and other characteristics of our population would show a higher incidence of pathology, but it also is possible that when it is four times more likely to happen to an American woman than to a Swedish woman there are other factors operating within that system, and maybe they ought to be addressed. Of all hysterectomies no more than 20% are performed for cancer or other life threatening disorders. A large number are done for sterilization despite the availability of less complicated procedures. Those kinds of procedures, by the way, are all the kinds that are reimbursed by the third party mechanisms. It does raise a question as to whether or not we can begin to shift some of the incentives within third party reimbursement to emphasize prevention and the less costly modalities as opposed to the highest style or the highest cost kind of thing we can do which, in this particular case, would be to take out a uterus.

The next characteristic is public understanding. I don't think the solution is within medicine. I think there are things within the way the medical system behaves which can result in some cost containment, but I think the biggest solution of all is in public understanding of the system, the public's willingness to change the way they take care of themselves and the way they use the system. The average consumer is really either uninformed or unwilling to use the information that they have. For example, that emergency room visit by the Medicaid patient at St. Paul Ramsey or at Hennepin General is likely to cost several hundred dollars to somebody within the system. Knowing more about themselves and being involved in a health education program or even a self-care program certainly costs a lot less and is probably more effective in the long run. We do find that Governor Perpich, in that portion of his message to the legislature which related to health did not start off in a conventional way by talking about doctors and hospitals. He started out by saying that experts tell us that 90% of our health problems come from things we do to ourselves or don't do for ourselves. We eat too much, smoke too much, drink too much, don't get enough exercise, don't eat the right foods, spend too much time in front of television sets and too little time outdoors. Bad habits keep us from feeling as good as we could and living as long as we could. He goes on to say that we should place high priority on identifying and treating health problems and possible disabilities early in life. We should teach people how to take better care of themselves and give them an opportunity to do so. We should study ways to make routine preventive care more available and less expensive and find more of the answers to crippling and disabling illnesses that strike healthy people as well as those who don't take care of themselves. The Governor then went on to propose a number of measures most of which we did enact in the 1977 session of the legislature. I think for that reason that recommendations from your Commission in the area of health education and shifting responsibility back to the individual certainly will have a very good reception both from Governor Perpich and legislative leaders. Your chief concern, I guess, is what we can do here in Minnesota. You may not be aware of all of the actions taken in the 1977 session, and maybe what you should do is to examine them and see if they can be improved. See if they are in fact conducive to cost containment and measure the results as they are known during the scope of your investigation.

The Medicaid program is about an eight hundred million dollar program in the state of Minnesota. It is subject to tremendous abuse both by providers and recipients. The average Medicaid family uses 120% of health services compared to the average American family so the problem has not been access to health care. The Medicaid program has been increasing by somewhere between 20% and 25% a year. For the first time in 1977 Medicaid in Minnesota is budgeted. Prior to this, it was an open-ended appropriation. The Department of Public Welfare would come back for a deficiency appropriation if they went over budget. You can't do that, by the way, in any other program. The Department of Natural Resources, the Highway Department and everybody else has a budget. Medicaid was totally without a budget—completely open-ended. We put it under the budget system in 1977. We gave it a fixed amount of money to be spent and we went on to give the Department of Public Welfare, which is the Medicaid agency in this state, the authority to reduce vendor payments in order to meet the budget. We are trying to make that agency operate on a more business like basis. The biggest health program we have in the state of Minnesota is the Medicaid program. The biggest single program and yet until recently, very little effort was being put into seeing that we could get a cap on it and budget it and treat it in a business like manner.

The second thing we did was to authorize a study on a proposal for co-pay that would be ready for the legislature in 1978. That happens to be a favorite of mine. It caused many of my old liberal friends to say that I had lost my head and that I was against the poor people. Co-pay, obviously, is beginning to try to get people to think a little bit about the fact that when health services are utilized, it costs somebody something. We were proposing during our Conference Committee on Health and Welfare a very modest co-pay provision—no more than $3.00. The idea was that people in the Medicaid system would then at least think about the health expenditure that they were causing if it cost them 50 cents or $1.00 or $2.00. We didn't think the rates were so high that anybody, including those on public assistance, could not pay them. There will be a study of that during the interim and it will come back in 1978 for approval of the legislature and I hope they approve it. It certainly is not a panacea but it is the beginning of heightening awareness.

Another thing that we did is to expand the Community Health Services Program. We started it two years ago and expanded it in 1977. The program is a state subsidy to counties and communities that emphasize prevention, self care, health education, home care nursing, pre-school screening, and those kinds of programs which are the 1% of the system. The expansion of Community Health Services means that we will have a statewide network of those kinds of services. Communities can begin to emphasize things like education and give incentives to prevent disease, or at least pick up disease at a time when we can do something about it at less cost.

The screening program that we passed is for children coming into the school system statewide and applies not only to Medicaid families as the Early and Periodic Screening Program did under Title XIX, but it is a statewide program for all kids at that age, Again, it offers an opportunity, with the parent bringing the child in for the screening, for us to begin to educate people. Educate them as to what they can do in areas like nutrition and immunization. The kinds of things you can do within your own family to keep the family healthy. We hope to build an educational component into that program which will cover, within about two years, about 55,000 children in Minnesota. Hopefully, there will also be 55,000 parents getting some kind of education as to how they can more effectively take care of themselves. I hope you don't think I'm irreverent if I say that the objective of all these things is to keep everybody away from doctors and hospitals, but that is really what it is and no offense to the medical people or the hospital administrators. It would be ideal and utopian and it isn't going to happen, but it is possible in relative degrees. We think that things like the programs I have talked about are a step in that direction.

As you know, Representative James Swanson and I are co-chairing a Joint House/Senate Committee that is looking at proposals that relate to health costs. We are going to spend a lot of our time looking at things that you are very familiar with, being discussed at the state and federal level. Things like certificate of need. We are also going to look beyond those. We are searching for, and perhaps this is an area in which we can work together, ways in which we can provide new and different kinds of incentives to people to change their life styles and assume more responsibility for their health. I'll go into that in some detail, but about half the work that we are doing in the House/Senate Joint Committee does not relate to the system at all as we know it today. We are trying to determine future directions in health care, what we can begin to do here in the state of Minnesota to change the system down the road, which not only, I think, would create a better system, but result in one that we could afford and that won't break the bank. The proposals we are looking at that I think will receive serious attention include amendments to the Certificate of Need Law. We think that it should be strengthened and conformed to the federal law.

I'd also like to look at the practice laws for non-medical health professionals and begin to provide for those who are serving communities to get reimbursement for the services that they perform. I am not under any illusion that adding nurse practitioners to the system is inherently going to be cost effective. In fact, it may add another layer of cost to the system, and I know that is a possibility. However, some of the surveys that have been done show that patients in communities are willing to have non-medical practitioners serve them in a number of procedures that traditionally have been reserved for medicine itself. If people are willing and the outcomes are not such that we are lowering the quality of care, I think it is worth looking at and should be tried.

I'd like to eliminate continuing medical education as we have known it. Politicians respond to the question of how to keep doctors competent by placing some kind of a compliance mechanism on them. State legislatures have said you have to do 50 hours of something every year so that we will all be assured that you are continuously competent. Honestly, folks, I'm not sure that that is really going to accomplish the goal unless we know what the profile of your practice is and unless the competencies are broken down so that they relate to your practice. That is, if you are a general practitioner and your clientele is aging and you haven't been back to medical school for awhile and you are not updated on drug interactions for older people as they may vary from those you find with middle age population — you may be out of date and out of touch. There is nothing in our law in continuing medical education that will do anything for you unless you are smart enough to find the courses that relate to geriatrics and gerontology. In addition, those things are not taught much in medical school, so I am not sure that we can lay 50 hours on you and make you competent. I think that is an illusion, and I am afraid I have been part of that thinking in the past. I'd much rather look at relicensure or recertification on the basis of competency within the practice that you as a physician, or a nurse, or a pharmacist are actually practicing in the real world. It does no more good to test rural physicians on standards that would be fine at Mayo or the University of Minnesota in a tertiary care center than it does to have the people at Mayo tested by standards that the rural physician would say is OK.

Right now our licensure procedure is strictly a compliance program and unfortunately, a licensing board is faced with a win lose kind of situation. The problem is brought to you about a practitioner who has done something. Usually the way it works even with putting public members on, is that you are very reluctant to jerk a license. A person has put a lot of time and a career of dedication in nursing, pharmacy or medicine. It is very, very difficult — it takes almost a felony to get a licensing board to jerk a license. What happens is that either you give them the right to practice that particular profession with almost unlimited privileges, or you take it away from them. You take away their bread and butter. There should be a way in which a licensure or a certification authority could determine whether that person is able to function within their scope of practice in a competent way and to identify the areas where that person may need to have that competency upgraded. If that can be done, it can be done as a remedial thing so the practitioner comes out of the process with the skills that he or she needs. If he or she doesn't come out with those skills at least then you can define what the practice might be and you have a parameter within which that person would have hospital or other professional privileges. It seems to me that makes a lot more sense than having to make that tough decision on whether you jerk the license or not. I would suggest that if we work on that problem during the next 2 to 5 years, we can come up with some solutions here in the state of Minnesota.

We also should look at the way in which we are providing incentives for persons to be placed within medical model kinds of programs where that program is not necessarily appropriate. I am referring to our system of long term care and I am referring to the periodic medical review that was done by Dr. Winston Miller two years ago. He found that about 6,000 of the patients in our skilled care nursing homes have a primary diagnosis of mental illness. Most are under 65. They are in a program which is medically, nursing and chemically oriented and when we surveyed them, they had been in those places for 18 months. They had been getting something like 5.7 meds a day in a medical model, though the primary diagnosis was mental illness. Now as an example of what we can do about that, we are licensing what we call a Rule 36 facility which is a residential community based program for mental health where the cost is less than skilled care. It is not the medical model, but the programs are oriented toward their particular disability. It just makes a lot more sense to me that we do that rather than putting them in a skilled care facility where it is not only more costly, but much less efficacious.

Another area I think that we are going to be looking at is the use of drugs prescribed by M.D.s obviously under pressure from the patient for someone to "Give me something or do something for me, Doctor." The hard use of drugs in this country is wonderful for the drug companies, but I think it is a serious problem starting with alcohol and going down to all the others-valium, librium and down through the whole list. We are just consuming drugs in outlandish proportions. The extent to which you can help us find some solutions to how to disabuse people of that particular life style would be very helpful. I started to talk to you a little bit about medical education and would like to go back to that very briefly. If you train physicians in a high technology, high style of medicine, you are going to get people coming out of those places that have had very little experience in dealing in alternatives. The Rural Associate Program at the University is an excellent program. It gets medical students out of the University and into the real world, and it should be expanded. But up until very recently no medical student was permitted or given credit for having an experience in a health maintenance organization or in some other alternative mode of practice. We have waged wars in the past trying to get the people at the University to put some of those students through a program where they are at least exposed to what an HMO is and what is different about it.

If you read Dr. Robert Butler's book on aging and on the Older American community, you know about the emphasis in medical schools on geriatrics and gerontology. If the population is aging and if physicians are going out and practicing with that population, how in God's name are they going to pick it up unless they begin to get it in medical school and in residency programs? There are some residencies now where they put people in long term care facilities and in community clinics but there ought to be more of them. It is not a typical population over in the medical complex at the University of Minnesota. That is not what students are going to find, at least many of them, when they get out into real practice. I think that we have to relate it to real practice.

Obviously, we need to look at manpower distribution. As we go through this whole procedure of planning for capital and health care facilities, we need to have people in those facilities that are appropriate to them, and to the programs that will be provided in them. We have done very little planning in manpower as you know. The federal government and everybody else has helped create a system where we either produce too few physicians or we get capitation grants and double the size of medical schools. We are going to produce all kinds of physicians. By 1985 we will certainly have too many physicians. Manpower distribution of course is still dependent on market forces. Even with our family practice programs here — we have been into that for what 5 or 6 years — we are just now beginning to see young family practice residents going into practice outside of the Twin City metro area, Rochester or Duluth. I think what will continue to happen is that they will want to go to St. Louis Park, Coon Rapids, White Bear Lake and those kind of places with the amenities. When the business gets slower and they can't make what they thought they were going to make to pay back their loans, then they are going to move out. The distribution problem is a tough one. I don't agree with Senator Kennedy that we ought to tell everybody where they have to practice, but we have to figure out some way to provide incentives for redistribution.

To wrap it up, responsibility for health care costs has got to be shared by all of us — providers, consumers, bureaucrats, employees and politicians. Solutions also have to be shared. I guess the best advice I can give to providers in the health care system is to be open to change. Whenever anybody has a new idea of how to change the health system, the providers within the system do everything they can to resist that change. Unfortunately, it puts us in an adversary position by which people opposing the change either win or are dealt out of making any real contribution. What they may do, though, is dilute the decision through the political process so instead of having the best of their contributions, we have the worst.

It is going to be real tough for legislators to go out and do what I am doing in their legislative or congressional districts. That is, tell people that they are going to have to change their life style, but that is just exactly what is going to have to happen. We are now more aware of running out of energy, running out of water, and running out of fuel — these things are going to keep on happening to our society and perhaps help to condition us that we have to take a hard and realistic look at our lives. But it takes a lot of courage and it is going to take a lot of time. It is not going to happen over night. People have to change their life style and the way they take care of themselves in this country, or we are simply going to break the bank in trying to provide the medical care that we have been providing in the past. I guess government is going to have to start resisting that desire to be all things to all people. I think that we have to begin to emphasize that along with the right to health care there is a responsibility. I am reminded of the day I was at the State Health Coordinating Council and we were talking about making facilities available. We were talking about renal centers for dialysis and some people from the rural areas said they wanted to have, I think it is called an end state renal dialysis center, within one hour driving time of everybody in the state of Minnesota. We argued about that and I guess the consensus of the Council was we really are going to have to look hard at standards of accessibility. I don't think it is the responsibility of government or of the health system to put an ESRD center within one hour drive of everybody. If you have been in northern Minnesota, you know what that would cost. And furthermore, you wouldn't be doing enough renal work in that particular area to be competent. I really think that is something we are going to have to change in terms of public perspective.

I think that employers and many of those represented here on your Commission can play an important role in changing our views of health care, the way in which it is practiced and the way in which it is used by our employees. I think that the private sector now can assume a partnership with government in trying to provide incentives for people. I don't have any easy answers for how we do that, though I know there have been some models for it. I can say that top management is increasingly concerned about the cost of health care and is looking for ways to help contain those costs. Perhaps your Commission can help employers to identify how they can make a contribution to a solution of this very serious problem.

Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

The Editors

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TRUSSES
SUPPORTERS
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THE ANXIETY-SPECIFIC.

- a predictable pattern of patient response
- seldom associated with serious side effects, in proper dosage
- rarely interferes with mental acuity
- used concomitantly with many primary medications
- three dosage strengths meet most patient needs

LIBRIUM® CIV
chlordiazepoxide HCl/Roche
5mg, 10mg, 25mg capsules

Libritabs® (chlordiazepoxide) available
in 5 mg, 10 mg and 25 mg tablets.

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Before prescribing, please consult complete product information, a summary of which follows:
Indications: Relief of anxiety and tension occurring alone or accompanying various disease states.
Contraindications: Patients with known hypersensitivity to the drug.
Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants. As with all CNS-acting drugs, caution patients against hazardous occupations requiring complete mental alertness (*e.g.*, operating machinery, driving). Though physical and psychological dependence have rarely been reported on recommended doses, use caution in administering to addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions), following discontinuation of the drug and similar to those seen with barbiturates, have been reported.

Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: In the elderly and debilitated, and in children over six, limit to smallest effective dosage (initially 10 mg or less per day) to preclude ataxia or oversedation, increasing gradually as needed and tolerated. Not recommended in children under six. Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider individual pharmacologic effects, particularly in use of potentiating drugs such as MAO inhibitors and phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions (*e.g.*, excitement, stimulation and acute rage) have been reported in psychiatric patients and hyperactive aggressive children. Employ usual precautions in treatment of anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation have been reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship has not been established clinically.
Adverse Reactions: Drowsiness, ataxia and confusion may occur, especially in the elderly and debilitated. These are reversible in most instances by proper dosage adjustment, but are also occasionally observed at the lower dosage ranges. In a few instances syncope has been reported. Also encountered are isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent and generally controlled with dosage reduction; changes in EEG patterns (low-voltage fast activity) may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice and hepatic dysfunction have been reported occasionally, making periodic blood counts and liver function tests advisable during protracted therapy.
Usual Daily Dosage: Individualize for maximum beneficial effects. *Oral—Adults:* Mild and moderate anxiety and tension, 5 or 10 mg *t.i.d.* or *q.i.d.*; severe states, 20 or 25 mg *t.i.d.* or *q.i.d. Geriatric patients:* 5 mg *b.i.d.* to *q.i.d.* (See Precautions.)
Supplied: Librium® (chlordiazepoxide HCl) *Capsules,* 5 mg, 10 mg and 25 mg—bottles of 100 and 500; Tel-E-Dose® packages of 100, available in trays of 4 reverse-numbered boxes of 25, and in boxes containing 10 strips of 10; Prescription Paks of 50, available singly and in trays of 10. Libritabs® (chlordiazepoxide) *Tablets,* 5 mg, 10 mg and 25 mg—bottles of 100 and 500. With respect to clinical activity, capsules and tablets are indistinguishable.

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The published record on Librium is enormous. So large, in fact, we put it into a computer literature retrieval system to make it more accessible in answering your inquiries.*

It's a record that reveals a consistent pattern of patient response. A highly favorable benefits-to-risk ratio. And minimal interference with many primary medications.

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